The Commercial Car Journal

VOLUME XIX

PHILADELPHIA, APRIL 15, 1920

NUMBER 2

What Kind of a Business Policy Have You?

Are You One of Those Dealers Who is Trying to Do Business in a Haphazard Way? If so, You Will Benefit by Reading This Article a Second Time

By C. P. SHATTUCK

R DEALER.—If you found at the end of your fiscal year that you had lost several thousand dollars, would you quit cold? And if you decided to continue another year, and then discovered the profits nil, what would you do? I have asked these questions of a number of different dealers—the successful, the mediocre and those with vacillating policies, and the census of opinion was that there is but one answer—lock the doors.

There is one dealer, however, who has been through a similar experience, who not only lost money for the first and second year but was actually confronted with a deficit at the end of the third. But this man did not quit, for he knew that his business policies were right, that he was building on a sound foundation, and that eventually he must win out—and he has! There is concrete evidence to this effect in the large number of trucks of the make he represents in his territory, and the way the trucks remain "sold."

Price Policy Lost Sales But-

One of the principle reasons for the success of this dealer was his price policy. His determination to have but one price—that of the list plus the freight charges—made him grit his teeth many months, especially when the shopping type of purchaser made attractive cash offers and when the salesmen reported that another company would obtain the contract unless concessions were made.

It was most discouraging for the salesmen and the dealer to meet certain kinds of "competition," such as big discounts in the form of trade-ins, a "special" price on the body, cab or equipment. But in those days of trial the one price policy was adhered to. It is as rigidly enforced today as it was when this dealer first opened his doors, and it is practiced with cabs, bodies and equipment. It applies also to the change in price now in effect on his line. The writer was in the salesroom when a customer who has several of his trucks terminated his talk with the salesman by saying, "I'll give you an order for that truck if you will put it in at the old price." The salesman refused, and the prospect went over the salesman's head with the same result.

Two days later the truck was sold to this prospect and at the new list price.

What Sold the Prospect

The sale was made because the customer had confidence in the dealer, knew that there were business reasons why the factory advanced the price, and believed the dealer when he stated he had none of the model in stock. Factor number two was that past experience taught the customer that the dealer lived up to the letter in his service and guarantee policies, and it is these policies with which this

You Can't Loose if You Stick to a One-Price Policy

story has to do. They begin with the sales policies, in which the price factor is prominent. It is in built-in-the-sales organization that they are merchandising three things; namely, a high-grade truck, a bonafide guarantee and dependable service.

How Guarantee is Interpreted

The salesmen are trained to sell motor highway transportation, not to solicit orders, and to merchandise the guarantee and service policies. When a truck is sold there is given in addition to the standard or maker's warranty the following guarantee:

"It is also agreed that the purchaser shall bring his truck to our service station at least once each month for inspection by our mechanic, said inspection to be free of charge. The failure of the customer do to this nullifies

This agreement requires the customer to co-operate with the service station. Upon the sale of the truck an entry is made of the name of customer, address,

business, body supplied, model, chassis number, etc., for the purpose of keeping track of the inspections, repairs, etc. The data is in card index form and readily accessible to the service manager. Entry is also made on what is termed a customer's card and the data filed and indexed

Educating the Driver to Service

Immediately following the sale, the service mechanic spends two and one half days with the new or green driver, teaching him how to operate the truck. If the driver "knows" how to drive a truck he is shown how the new truck should be driven. This enables the service mechanic to obtain a very good line on the driver's characteristics, and the knowledge is extremely valuable when the inspections begin. Another half day is devoted to educating the driver how to lubricate the truck, how to make the minor adjustments, etc. And the driver does this work under the direction of the mechanic.

The inspections following are not made at the service station; that is, it is not the policy to rely upon the driver to bring the car to the service station. This method has disadvantages, as the average driver will not call of his own volition. So the inspection mechanic goes after the truck and the driver. Inspection is made, however, at the station, but only when the driver is present. There is a conventional inspection report that is filled out, showing satisfactory condition of the components, those requiring attention and which were adjusted, and items requiring shop work. The form is made in triplicate. One sheet is filed at the service station, the second goes to the driver and the third to the owner. The service mechanic also fills out a card shown herewith and this is filed, out. showing satisfactory condition of the components, those requiring attention and which were adjusted, and items requiring shop work. The form is made in triplicate. One sheet is filed at the service station, the second goes to the driver and the third to the owner. The service mechanic also fills out a card shown herewith and this is filed. It enables the service manager to keep in touch with the condition of the trucks and to determine the lack of response by the driver. If shop work is needed, for example, and the driver fails to have the work done, it will be noted by the service manager and the driver is called to account. If the second request does not produce results the matter is then taken up directly with the owner who is supplied, if he desires, with concrete evidence as to his employee's shortcomings.

Places Blame Where it Belongs

In connection with the system a record is kept of the cost of repairs on each The service manager keeps very close tabs on the cost cards and an interesting example of their value was shown to the writer in connection with two trucks of the same capacity, owned by the same company and in the same line of work. Both machines were placed in service at about the same time. The records showed that the repairs on one cost over \$700 and the other practically nothing. Investigation of the service records told the story-a bad driver. Inasmuch as the driver presented what appeared to be plausible excuses to the owner, it was suggested that he be placed on the other truck. The result was the same, a big bill of expense to the owner.

While every effort is made to sell the driver on the inspection plan his owner's interests are first considered. Therefore, if the driver fails to co-operate the following letter is mailed to the owner:

"In accordance with the terms of sale, guarantee, etc., you were to have your truck inspected once each month by our INSPECTORS—and, the failure on your part to do so, automatically cancelled and voided the guarantee which you received on truck.

OBJECT AND VALUE OF INSPECTION— The inspections referred to, are made so as to prevent the developing of serious troubles; to ascertain if truck is receiving proper care; and, to instruct the operator of truck, as to the proper care and operation of same. Especially greasing and tightening of nuts and bolts.

You therefore will readily see the value of these inspections. Not only will the dealer and owner benefit from same, but the driver will learn how to properly care for the truck, which will materially prolong its life.

We urgently ask that you send your truck in once each month; arrange for inspection in advance, by 'phone or letter, and instruct your driver to work with our inspector in going through the greasing of the truck. By doing this, he will receive direct benefit which will reflect in your favor by prolonging life of the truck.

After this inspection is completed, you will be mailed a report, showing the condition of, and recommendations for, handling and care of the same.

Remember these inspections are FREE—but, please do not consider them valueless.

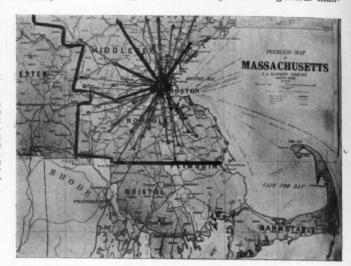
Yours for Service.

the workman a square deal and avoids the possibility of the executive playing favorites, which is possible with the oneman control of a shop.

The demerit sheet ultimately goes to the general manager, who asks the superintendent to prepare a list as to how the men grade and to make suggestions as to the leaders in each class. The date is then submitted to the Board of Managers, which comprises the general man-

Service and Dealer Map

The service stations conducted under same policies as the parent organization are indicated by the broad lines and the associate by the finer lines. The map indicates the policy of the company as to zoning its service stations.



Mechanics' Share in Profits

This dealer, who is the general manager of the company, has made an intensive study of the mechanic and has worked out a profit-sharing system that provides the wielder of the wrench with an incentive to become more proficient. It is a bonus system and the men share in the net earnings. The men are classified to a certain extent; that is, an old experienced mechanic receives a larger share than the apprentice. All, however, receive a bonus. Awards are made on a merit system. Each man starts with a clean record, but whenever a job he has worked on comes back with a complaint, and the work is faulty, he is marked a demerit. The demerits are made by the foreman and shop superintendent, but the mechanic is always present at the examination of the work. This insures

ager, assistant manager, sales manager, service manager, superintendent of service and foreman of shop. Decisions as to the award are made by the majority rule.

Other Incentives to Workmen

Successful efforts are made to instil in the minds of the mechanics that they are a part of the organization, that they are a factor in its success. They are encouraged to make suggestions for the improvement in service, cutting down the time of operations, time and labor-saving devices, etc., and the writer was informed that the men have responded. If they have any grievances they are given a hearing and are assured of a square deal. This has brought about a confidence in the organization.

The "one big family" policy is confined not alone to the more serious side -the business-but also to the social functions given by the employees. The assistant manager encourages social gatherings of the men and promotes bowling matches, in which the service men are pitted against the sales forces; outings to the beaches; dinners, etc. Each official attends these events and is, for the duration of the event, "one of the boys." At stated intervals the company gives a dinner to the organization and here again the assistant manager displays a keen knowledge of human nature. He sees to it that the mechanic gets "a real feed," not fancy dishes. Among the outings planned for next summer is a trip to a beach in trucks and the officers of the company are going to ride with the boys. This spirit has resulted in the mechanics taking a personal interest in their work, in the success of the company, so much so that recently when labor agitators attempted to organize the mechanics not one of the company's men



The Service Station of the Company
It is operated independently of the sales organization

Special Notice

We are looking forward to some changes in Shop Routine which changes will come about just as soon as conditions permit.

These changes are, briefly, as follows:

We are desirous of dividing up the SHOP and the WORK into DE-PARTMENTS, such as: "Motor Department"—"Transmission Department"—"Rear End and Frame Department," etc., each Department to have its own Foreman, who will have charge of men in that Department, and to be responsible to Superintendent for Quantity and Quality of Work turned out.

We want the MEN to look forward and work towards this end. We want the MEN to prepare themselves to take the Foreman's Positions; to have charge of men, and work, in the Several Departments, and to prepare for same.

You should take an INTEREST IN THE BUSINESS and in the WORK and "Report" things to your Superintendent which, in your opinion, are not right at the present time.

Take an INTEREST in things Generally, and "STOP" the Petty Larceny, and also "STOP" the "kicks" that have been coming to us about "Killing Time," etc.

To such MEN who show an interest in the business, and prepare themselves to take charge of a "Department," belongs the SPECIAL CONSIDERATION when Time Permits such Changes.

We ask that any MEN who are interested and desire to qualify as Foremen of these Different Departments, that they "report" to SUPER-INTENDENT—AT ONCE.

SERVICE MANAGER.

This Notice Was Recently Posted on the Shop Bulletin Board. It is Self-explanatory

attended the meeting or gave an ear to the organizer. Realizing that the men appreciate a half holiday on Saturday during the summer, arrangements are made whereby the men spell each other.

Promotion the Reward for Efficiency

The Board of Managers see that the mechanics and heads of the service station are supplied with trade information. Copies of THE COMMERCIAL CAR JOURNAL are given the men and notices are posted on the shop bulletin board calling attention to articles of value to the men in their work, and the page on which the story appears is also given.

Uniform Service Throughout

In addition it should be mentioned that the company is to pick men to head the service stations to be established in three counties, and that eventually the company will develop and supervise organizations conducted along the same lines as described. This will give the men an op-portunity for advancement, also, to become executives in their line. This brings up the subject of giving service on trucks in the territory of the associate or sub-dealer. At present three cities have organizations operating along the same lines as the parent body. The balance of the territory is taken care of in the conventional manner by garages or repair shop, but these do not stock parts.

Owners in the isolated territory are educated to call the company when in trouble and the former are directed to the nearest service station or repair shop. If parts are required a man is sent with them by the first train or, if within rea-

sonable distance, in a car. These subagents also sell trucks and are aided by the company's salesmen. No sub-dealer is allowed to handle two makes of trucks.

Eventually the plan of the company is to establish organizations in zones so that all owners will receive exactly the same service and attention. This is the only logical solution of the service problem, says the general manager.

Value of Board and Salesmen's Meetings

The "big family" plan is practiced in shaping the policies of the company. The Board of Managers hold weekly meetings at which all problems are discussed and solved, and the majority rules. The different departments being represented eliminates the "passing of the buck." The salesmen's meetings are also held weekly. The information gathered by the sales manager at these meetings is presented at the meetings of the Board of Managers.

Every effort is made to co-operate with the salesmen in supplying them with data and the education of the men as to the other truck is very thorough. They are assisted by a system of efficient follow-up letters. The rule as to trade-ins is strict. The allowance price is that of the used-car market or junk. All trucks of the make handled by the company are rebuilt and painted and a guarantee of three months is given the purchaser on parts and labor.

How Overhead is Figured

The service station is operated independently from the sales end. Cash is paid for all work done on the trucks, including parts. All work, however, is charged at cost. The cost of selling, service, advertising, etc., is charged up to truck expense and to each individual truck so that the net profit of each and

Service is the Keynote With All of These Men



W. H. Baker General manager



Irving Lathrop Superintendent of service



J. C. Conley Sales manager



Charles McDowell



E. H. Baker



George C. Feindle Service manager



Oscar Johnson Foreman

Some Bakerisms

The customer buys and pays for a perfect part and is entitled to have defects made good and promptly and free from all expense to him.

The promise of service, explicit or implied, is the foundation on which friendly and mutually profitable business relations are firmly and permanently established between the dealer and the customer.

There is but one price to be given a prospective customer, the factory list plus the freight charges and war tax. The dealer with a one-price policy will never make the error of giving the "wrong" price to the "right" party.

Don't hesitate to keep in touch occasionally with owners you have sold. Ask them how things are coming. Let them know that you are keenly alive to their interests and ready and willing to render any little help you can. This kind of service doesn't cost much but it pays big dividends.

Many salesmen try to "get the order" through by making extravagant promises of free service discounts and concessions, but generally speaking, they are getting farther and farther away from the goal because they have started on the wrong track.

An efficient, fully equipped service station, well-stocked with parts and under the direct supervision of a man who is alive to the fact that a truck, to be of value to its owner, must be constantly in the condition to do business is the best method of advertising.

Don't be grouchy or preoccupied when the driver comes to you with his troubles. Greet him cordially. Help him out of his difficulties and encourage him to come again. It may not be ten minutes before some prospective customer will stop and ask him how he likes his truck and the kind of service which you have just given him will influence his answer.

cash investment for the sake of turning a sale and getting a little ready cash to pay his overdue rent, is encouraging the shopping type of truck purchaser. Both the dealer and purchaser are foolish. Price is transitory. The day will surely come when guarantee and service will loom big on the horizon, when the purchaser will seek the dealer for assistance in getting his disabled truck in commission — forgetting that he has tied the dealer's hands financially and left him no profit in the original transaction.

"There is no hope for the truck industry in the hands of this class of dealers but, fortunately, this class is in the minority. The successful dealer will be the man who builds a sound foundation, and who possesses ability, stability and reliability. These, with good will and fair play service, furnish a foundation on which any business may be built."

The dealer referred to is W. H. Baker, and the organization, the Baker Motor Sales Company, of Cambridge, Mass. The Board of Managers, which directs the policies, includes in addition to Mr. Baker, Charles McDowell, assistant manager; John C. Conley, sales manager; George C. Feindle, service manager; Irving Lathrop, superintendent of service, and Oscar Johnson, foreman of service station. The organization distributes Selden trucks in Essex, Middlesex and Suffolk counties, with headquarters at Cambridge.

in all transactions can be determined. The executives of the service company have an incentive to produce in the shape of shares of stock. And they produce.

Such is an outline of the policies of the dealer who lost money for three consecutive years, but each year the loss was substantially cut down. Some time ago he issued a letter, extracts of which are reproduced because of the limited circulation of the letter, and the sound advice it contains for the young dealer. "The dealer who has his resources all tied up who is willing to sacrifice all profit and many times dip into his actual

Various Cards Employed by the Sales Department

	PRO	SPECT CA	RD							
FIRM NAME		PHONE								
STREET					SALESMAN					
PERSON TO AD	DRESS	BUSIN	NESS							
KNOWN THROL	IGH	INTER	INTERESTED IN							
PEF	SONAL CALLS		WROTE							
DATE	REMARKS	FORM	DATE	LITERATURE	REMARKS					

The Salesman's Prospect Card

Indicates type of literature to be sent. The follow-up letters are written on different types of letterheads and varying size and color envelopes are also mailed the prospect to attract attention

STREET							
PERSON TO AD	DRESS					1	
Source of Inc	QUIRY						
LIST	LIVE] ,	RADE-IN	Enuc	ATIONAL		
DATE	ADV.	DATE	ADV.	DATE	ADV.	DATE	ADV.
- What	July 1			- 4			
- 19		Wite :					
an isk			3			17.1	
10 4 E Hotel	4					27	

Form for Mailing Department
Indicates character of literature to be sent, thereby conserving time of salesman

RETAIL FOLLOW-UP PROSPECT CARD		
	- 2	
Firm Name		
Street	City	***************************************
Person to Address		
Source of Inq.	Put on Mailing	List No. (Check) 1-9-
What Vehicles Owned		***************************************
Demonstrated Model	On	191
Did you call on prospect? { YES NO Who	en will you see again?	
Remarks	***************************************	
***************************************	Dealer	***************************************
Date	Location	
Use this form to report retail prospects to whom you wish to	-141 W	on Truck Sales Co., Rochester, N.

The Factory Mailing Form

After a sale is made the owner's name and address is sent to factory and owner receives factory literature

		PHONE							
DRIVER INSPECT									
	RIVER INSPECTED BY								
CHASSIS NO MOTOR NO. DELIVERED DATE OF									

The Inspector's Card or Report

This is filed with the service manager and provides him with ammunition for effective educational campaigns

FIRM NAM				1	S CARD	onal campaign	
INDIVIDU	AL	1,5		-	BUSINESS		
STREET	EET				TOWN & S	TATE	
TIRES		FRONT	REAR		SALESMA	N	*(1)
INVO	INVOICE		n.		FEAR	MOTOR NUMBER	CHASSIS NUMBER
NUMBER	DATE						

The Customer's Card

Details of chassis, body, etc., are entered and card filed
for reference

A Good Profit Awaits the Dealer Who Merchandises Standard Truck Bodies

The Truck Dealer Who Does Not Handle a Line of Bodies is Losing a Good Many Dollars Annually. Quicker Delivery Assured Customer

Is it a good policy to give the customer what he thinks he wants, instead of what he should have, when it comes to the question of supplying a body for the chassis? Sales managers say that merchandising bodies is one of their problems and some state that their salesmen have as much difficulty in selling the body as they do the truck. If such be the case, and we have examples on every hand, it is quite evident that the policy of allowing the salesmen to follow the line of least resistance by acceding to the demand of the customer when it involves a department from standard practice is fundamentally wrong.

Involves Too Much Delay

A concrete example of the customer's influence was noted by the writer recently. The man had purchased a 5-ton chassis and desired a dumping body. Now the company stocked a standard body which met every requirement, and which had proven entirely satisfactory in service. But the customer insisted that he wanted a body several inches wider. So insistent was the man that the salesman put in an order for a body of the specified dimensions. The sales manager, however, after considerable effort, convinced the prospect that the standard body would serve his interests best and, although he did not so state, the body also best served the dealer's interests. Had the sales manager humored the whims of the salesman and customer it would have meant the construction of a special body, weeks of delay to the purchaser and, most important of all, delay in delivery. And when the truck is merchandised under certain selling plans, it is good business for the dealer to avoid the possibility of any delay whatsoever.

Lack Data and Practical Knowledge

With few exceptions, the purchaser desires a completed vehicle. While the older and more established dealer with ample reserve capital can afford to cater to the whims of his customers, and possibly his salesmen in the matter of specially constructed bodies, the younger dealer cannot very well afford to deviate from standard body practice, to wait for the local carriage maker to turn out a body. And this may be said to apply to the dealer in the undeveloped territory where the body builder functions as the blacksmith, horseshoer, carriage painter, etc. There is no doubt but what some of this local combination talent can construct a very creditable body provided proper dimensional data and other equally important information is supplied by the dealer. But the thought arises—is the average dealer sufficiently practical in body designing to supply a carriage builder of horse-drawn vehicles with instructions for building a body for a motor-propelled vehicle? And when the body is constructed, will it be properly mounted and best serve the interests of the customer?

Years of experience has taught that the manufacturer specializing in a line is more likely to produce a more satisfactory article than the one who has too many irons in the fire. And it is good logic to argue that the truck dealer will serve his own and his customer's interests best by selling a standard body. This article may appear an argument for the standard body, for the product of manufacturers who specialize in bodies for trucks-and it is. It is not any reflection upon the local body builder, those in the large cities. These concerns construct excellent work, but, as a rule, it is a made-to-order job and whenever the salesman accepts an order for a built-to-order job he will invariably incorporate some of his ideas. And his ideas are not always practical. An example of this kind was noted recently by the writer. The dealer sold the chassis, but the customer in-formed the dealer he had ordered the body elsewhere. It was a well-made and painted job, and when seen by the dealer in the paint shop certainly was a beautiful piece of work. But when mounted on the chassis it extended about four feet beyond the rear frame cross member, and decidedly too far beyond the wheel hubs. It certainly was and did look a misfit, but the owner stated he wanted room for big loads. And he got it. If that owner, who is to haul compact and heavy material, does not grossly overload that truck it will be a miracle.

Advantages of Standard Designs

With the number of manufacturers specializing in the construction of truck bodies, who produce standard designs meeting every requirement in motor highway transportation, bodies built along engineering lines and not by rule of thumb, and with regard to quality and serviceability, the truck salesman who cannot sell a standard body to his prospect or buyer of a chassis, is not serving the best interests of his customer or employer. The standard body can be sold the customer who thinks a made-to-order body will best serve his interests if the salesman is a good salesman and will make a study of the customer's requirements and advise a body that fits the truck, not the truck the body. Sufficient data is supplied both by the truck and body manufacturer to enable a salesman or a dealer to meet any and every requirement in motor truck transportation. Of course, there will be instances where special bodies may be essential to meet peculiar conditions, but these are an exception to the rule. Taking the average case coming to the attention of the writer, these dealers have investigated the product of makers of standard bodies and are stocking a certain number of the most popular or quick-moving types.

This Dealer Sells Standard Designs

In a talk with a successful dealer who sells the standard body, he said that he was sold on the idea largely because of the delay in securing bodies from the local builders. "And all things considered," said this dealer, "I make a bigger profit and have considerably less trouble than I did when I took orders for specially constructed bodies. And I have eliminated the body mounting troubles sometimes experienced. With the bodies I am now handling my mechanics make quick and easy work of mounting the sills and platforms, and I know when the job goes out that the frame is not drilled or section cut out to overcome some fault in designing or constructing the custommade job. And there is another advantage and that is the right type and size goes on the chassis, and when the truck gets out on the streets it looks like a real job, not a misfit. Yes, occasionally, we have to supply a custom-made body, but not very often, and it has to be something very special before we will accept an or-One of the best features of the standard body is that the time formerly spent by our salesmen fussing around with the special body is now used for selling trucks and bodies as a unit. And having a number of satisfied customers, we use them for reference. My orders to my salesmen is to sell the standard type, and when he cannot do so the old man

Manufacturers of chassis supply instructions to their dealers as to mounting bodies, but despite the educational campaign dealers frequently find trouble develops because of improper mounting. The drilling or cutting of the frame is not an uncommon practice, and it has led to many truck manufacturers to stencil in large white letters on the frame a caution against this practice. The International Motor Company adopts this method and, in addition, its chief engineer sends the following instructions for body mounting.

Proper and Improper Mounting

"Where bodies are built and mounted on our chassis, outside of our own factories, holes are oftentimes drilled in the upper and lower frame flanges. The upper flanges of a frame under load are in compression and the lower flanges, in tension. When a hole is drilled in the lower flange, it is the same as nicking a violin string drawn taut. This practice must be absolutely prohibited, and we would ask that you always be on the alert in advising body builders in this respect. Also, in regard to sills, it is very desirable that the body be so constructed that the

sills run the full length of the frame, thus avoiding concentrated loads. If the body becomes loose, there is much more surface brought in contact where the sill construction is used than where the cross framing is used. The side members of a motor truck frame are designed to support distributed, and not concentrated loads. Follow up each chassis sold and make sure that in mounting the builder places a longitudinal and not a cross sill next to the frame member. If a frame breaks, and it develops you have not followed the above instructions, guarantee to branch or agent will be void."

This supports the contention of the dealer who stated that with custom-made bodies frame troubles were experienced. Instances are not uncommon where drilling and cutting the frame have brought about a huge repair bill, for the replacing of a frame is expensive, and invariably the customer will try to shift the responsibility on the dealer, particularly if the dealer sold the body through a local builder.

The manufacturer of standard bodies has made a careful study of body mounting and avoids the possibility of damage to the frame in his designs. Having the

dimensional data of all types and models of trucks he is in a position to design a body that will fit the truck, care for the light and heavy or concentrated load, and supply the proper mounting sills and clips for securing the sills. Proper lengths and widths are also considered. With the designs referred to the dealer's mechanics can mount the sills and body without error, for the body is built for the chassis, and it fits the chassis.

Importance of Dimensional Data

Although the average truck manufacturer supplies either blue prints or data sheets giving a plan view of the chassis with dimensional data for bodies, the work of adjusting the customer's demands or measurements to those of the chassis is not always easy to the average salesman, particularly the novice. It is because of these conditions that the salesman takes the lines of least resistance and turns the work over to the local body builder.

In connection with body construction, with the ordering of a body, either the standard or custom made, it is important that a proper clearance be observed between the platform and the tires. Where

solids are used the average distance allowed by one body manufacturer is seven inches. With pneumatics this must be increased in proportion to the diameter of the tire.

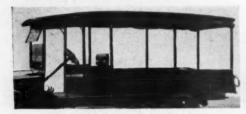
Service to Customer Most Important

Referring once more to the dealer not conveniently located to the large city where standard body builders maintain branches or where it is not practical to drive the chassis to such a branch, this type of dealer can obtain a body for his customer more quickly by ordering either from the nearest branch or direct from the factory of the body manufacturer, than by replying upon the made-to-order builder. And the profit will be greater, and this is without doubt the more important factor. And it may be news to some dealers to learn that a telegram, giving the make of truck, model and serial number, type of tires and type of body desired, is all that is essential for the body maker. He will do the rest. In the buyer's index of this issue will be found the list of body manufacturers, and they will co-operate with the dealer in solving the problem of merchandising the truck body.



Showing Five Different Designs of Bodies Manufactured by the Kratzer Carriage Company, Des Moines, Iowa.









The Kratzer Carriage Co. manufactures a series of standardized and special bodies for all makes of trucks. The two illustrations above show special enclosed, panel, delivery bodies for Ford model T chassis. The driver's seat, in the job built for Brinsmard Co., is distinctly apart from the delivery compartment, being separated by a partition. An adjustable ventilating windshield and storm curtain offers protection to the driver in stormy weather. Model 141½-F, shown in the upper left-hand corner, is especially designed for florists and dry cleaners. The cab is in unit with the body, which is fully enclosed and provided with plate-glass windows arranged in such a manner as to attractively display the floral work being delivered.

Models 85-T and 144-F are especially designed grocery delivery bodies for 1 ton Ford chassis. The lower center illustration shows the model 192 heavy-duty truck body built for any make of truck.



Stake Body Built by the Porter-Brown Auto Body Co., Los Angeles, Cal.

This body is substantially built, the platform being reinforced with irons and the sides, which are built in three sections, are fully equipped with hooks and the rear sections are provided with tailgate fasteners

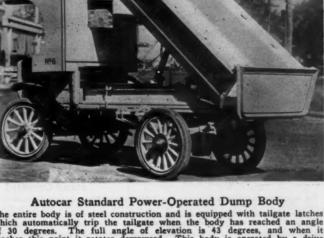


Novel Service Body Built on a Dodge Chassis by the Porter-Brown Auto Body Co., for the Albertson Motor Co., Los Angeles, Cal.









The entire body is of steel construction and is equipped with tailgate latches which automatically trip the tailgate when the body has reached an angle of 30 degrees. The full angle of elevation is 43 degrees, and when it reaches this point it rotates downward. This body is operated by a drive shaft direct from the chassis transmission through a worm and worm gear. The body can be stopped at any angle desired and the car put in motion with the body elevated.

Special Dump Body for the Transportation of Live Stock.

Live Stock.

Rear view of a double-decked stock body, which is being used by A. W. Post, a dealer in live stock, Liberty, Ind. As may be seen from the ilustration, the live stock to be transported is driven up stepped runways to either the first or second level. The tailgate consists of two sections, the upper section swinging on hinges and the lower section, which may be completely detached, is retained by two runners riveted on the two left rear stakes.



Autocar Combination General Utility Body for Hauling a Variety of Material

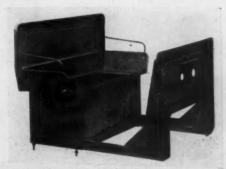
This combination body, designed to haul a variety of material, is mounted on the same type of under-structure as is employed in the dump body. In fact, it can be disassembled to accommodate the transportation materials requiring either a platform panel or truck body. Note the tailgate is arranged to hinge either from the top or bottom. The body is fitted with removable flare board, which makes it possible to carry a large crowned load of loose material. Ten extra stakes are also provided which fit into stake pockets.



Steel Body Used for Long-Distance Hauling of Heavy Freight

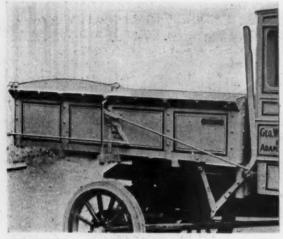
Hauling of Heavy Freight

This body, which is being used by the International Transportation Company, and which is mounted on an Indiana truck, is constructed of sheet steel reinforced with angle irons. The feature of this job is a railroad iron that is fastened at the top of the body and which may be extended about 4 ft. from the rear of the body for attaching a pulley for loading heavy freight. This style of body also assures protection against theft, for it is practically impossible to obtain entrance after the doors have been locked.



A Well-Constructed Steel Dash and Cowl

A Well-Constructed Steel Dash and Cowl, the Western Metal Specialty Co., Milwaukee, Wis., claims that its sturdiness is due to the fact that no rivets are used, and that all the parts are el-ric spot welded, which feature is said to eli: ...te vibration and also to protect the parts fi becoming loose. Its simplicity of construct... a requires very little labor in mounting it to the seat box on a truck chassis.





Hand-Operated Columbian Truck Body

By manipulating a long lever on the right side of the cab two operations are performed simultantously. This lever raises the body and brings other rods into play which open the bottom of the tailgate in co-ordination with the erection of the body. No extraordinary effort is required to raise the body, as the lever provides long leverage, and as the body is balanced practically at the center of gravity, which center of gravity is shifted sufficiently to bring the rear down almost automatically after the front end has been started on its upthrow.

New Principles of Design Are Incorporated in the National Dump Body

HE National Dump Body, Philadelphia, manufactured by the National Dump Body Co., confines several features of construction which provides a highly effective and economical operation. Much of the tre-mendous power that is required in conventional practice is said to be eliminated by reason of the fact that the lifting quadrants of this job transmit the power to the fore part of the body and also distributes it over a larger area. An additional feature is the tailgate, which automatically lifts clear of the body when the body

attains a certain angle of height, this action is partly due to the shifting of the center of gravity.

In the 2 cu. yd. size, as may be seen from the illustrations, the pivot point of the body, instead of being at or near, is 21/2 ft. from the end, and is not fixed. The design here com-prises a shoe and roller construction, the shoe being a steel casting fastened to the bottom of the body and the roller, also cast steel, 4 in. in diam., revolves in its yoke which is secured on the channel frame rigid with the truck chassis.

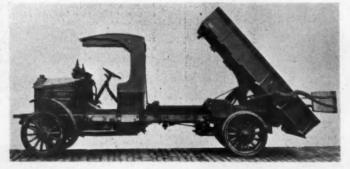
When the body is resting in its normal chairs which are fastened to the body un-

position its weight and the weight of the load is carried not on the rollers but on derbracing and which, in turn, rests on plates on the channel frame. When power for dumping is applied, the shoes come in contact with the rollers and the body as it elevates rolls to the rear 9 in. The body is prevented from traveling beyond an elevation of 50 degrees by a checking curve in the shoes. By reason of this construction, together with the location of the point of application of the hoisting quadrants to the body, unnecessary strain is eliminated, power is conserved and the need of heavier parts avoided.

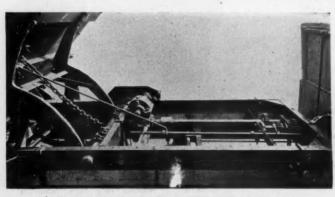
An interdependent part of the above construction is the self-opening tailgate. Two levers, on each side of the body, serve three purposes in connection with this gate. As the body is raised the tailgate opens automatically, permitting the uninterrupted passage of the material to be unloaded through a 30 in. x 52 in. opening. When the body is down the same levers hold the tailgate tightly up against the sides, thus preventing any part of the load from spilling.

If the truck is inadvertently backed into any obstruction the impact is taken through these levers, a contingency that will have no effect on the tailgate projections to be bent or broken.

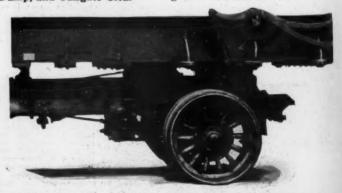
The hoisting mechanism consists of a steel worm with ball thrust bearings and bronze worm gear, inclosed in a housing that also retains lubricating The worm is self-locking and holds the body at any degree of elevation.



National Dump Body at Full Dump, and Tailgate Clear



Close-up of the Hoisting Mechanism



Rear View, Showing Body in Normal Position With Tailgate Closed

The hand control and mechanism connecting the truck power and the worm consists of a sliding gear on a countershaft. When the truck-power take-off lever is thrown in by hand, power is transmitted through this countershaft.

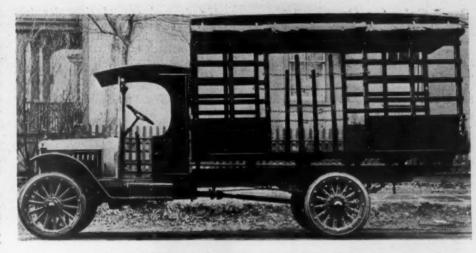
The sliding gear is then meshed with a gear on the worm-drive shaft, and letting in the truck clutch hoists the body. To bring the body down, the sliding gear is then shifted so that its jaws engage with dogs on the idle sprocket on the countershaft, and, through a short chain, turn the worm shaft in the reverse direction.

The automatic cut-out prevents the mechanism from being damaged in the event of driving the body too far up or down. The tension rod, in elevating, slides on a shifter shaft in such a manner that when the body reaches an elevation of 50 degrees it throws the sliding gear out of mesh. When the body is released and comes down, it strikes the down throwout rod, and a bell-crank forces the jaws out of the sprocket dogs.

The following is a brief resume of general specifications and other items of interest. This job has a carrying capacity of 54 cu. ft. and is applicable to 2 and 2½-ton trucks. The top of the body is 5 ft. from the ground a feature which facilitates loading by hand. A maximum dumping angle of 50 degrees can be obtained. The maximum loading space is afforded as the body sets immediately behind the cab an arrangement possible as the lifting mechanism is under the body.

Highland Bodies Cater to Farm Demands

The accompanying illustrations show three different designs of products put out by the Highland Body Mfg. Co., Cincinnati, Ohio. The special job of the company is a body designed for the farmer or county expressman. A special feature of this body is that it is self-contained. In this way always being prepared for a return load, with a body that can be adjusted to suit the condition. An-

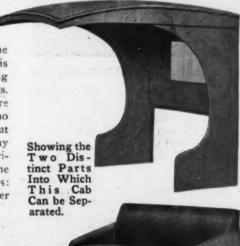


Commercial Heavy-Duty Canopy Top Rack Stake Body

This is the regular 2 to 3 ton, heavy-duty, canopy top, rack stake body manufactured by the Brooklyn Commercial Body Co., Brooklyn, N. Y. This job is such as to permit of loading on either side as well as the rear. Two long stakes, which lift into keepers on the edge of the platform reinforced by two chains which run parallel with the platform at the middle and near the top of the stakes are attached after the body is loaded to prevent any package from falling out of the sides. Heavy skids are also provided, which are housed along the body sills when not in use and are made for use either in the side entrance or from the rear. The cab, as well as the windshield, is regular stock equipment.

other design illustrated herewith is a combination body having a detachable tailboard that fits into keepers on the end of the platform and with hooks to attach securely to the side panel. Another job of this company is the stake body shown in the accompanying illustration mounted on a U. S. chassis.

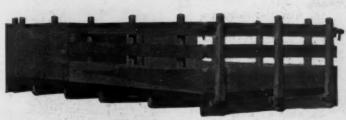
The Highland Universal Seat Cabs are designed for the manufacturer who wishes to make the seat standard, but desires to be able to have a cab at any time without changing the seat or sacrificing any other standard features. The dimensions of these cabs are as follows: back of seat to front, 48 in.; width over





Showing Highland Construction of Tank Bodies side rails, 51 in.; height over seat, 45 in.; spring cushion, $4\frac{1}{2}$ in. deep, 48 in. long and 15 in. wide.

The cabs can be used on jobs not over 20 in. wide and 50 in. long. This seat and cab assembly can be separated into two distinctive parts, the seat and the cab.



Highland Stake Body

Steel Cabs for Cold and Fair Weather Use

A cab that effectively affords protection against the elements of winter, and which can be readily converted into an open cab for fair weather use, is the product of the Sheet Steel Products Company of Michigan City, Ind.

The cab is largely a welded and riveted construction, insuring tight joints under the severe service of motor-truck operation. By reason of the double-wall construction throughout, the rough appear-



Sheet Steel Products All-Weather Cab

ance of angles and braces that would ordinarily be exposed is avoided. The methods pursued by this company in properly forming the steel, and by using this double wall construction, makes a cab that is durable without excessive weight and at the same time is said to have the flexibility necessary to take the weave of the truck frame. This job presents clean-cut lines and is unusually attractive. It is equipped with five glass windows carried in steel frames which may be

readily dropped out of sight for fair weather use. If an open cab is desired, the doors may be folded back and secured by a latch in the rear of the cab. The glass in the windshield, which is of the rain-vision ventilating type, is held rigidly by steel moulding.

By means of an improved double-acting door lock, the position of the door relative to the cab, can shift with the weave



Open All-Steel Fair-Weather Cab This cab is a special job built for the service truck. Note the steel door which swings outward in the lower left-hand corner, which closes a compartment under the seat of the cab for the storing of tools or other equipment.

of the truck without closing the door too tight or opening it. This same lock is also said to automatically take up any play that may develop from truck vibration. Window rattle is also practically done away with, by the utilization of steel springs that securely hold the windows in place in either the open or closed position.

Southern Motor Specializes on Ford Bodies

The body department of the Southern Motor Mfg. Asso., Ltd. Houston, Texas, manufacturers of tractors, trucks, automobiles, trailers, bodies, is devoting its entire efforts to the production of commercial bodies for Fords in large quan-

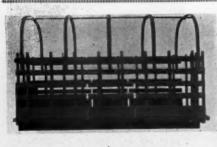


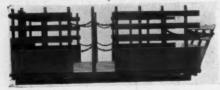


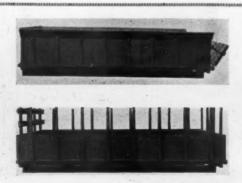


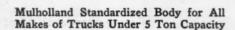
Three Styles Included in Ranger Line

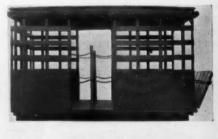
tities. This company decided, that by discontinuing the manufacture of special bodies and concentrating their activities to one line, it would not only be enabled to produce in large quantities and more economically, but would also enable their workmen to become more expert on the particular units they may be working. The progressive system of manufacture is pursued by this company, the product





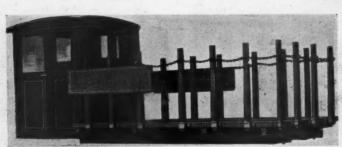








The Mulholland bodies manufactured by the Mulholland Company, Dunkirk, N. Y., are thoroughly standardized. The large variety of types being small interchangeable on platforms of the same size. The platforms of the bodies are built of oak throughout and are protected from excessive wear by floor irons, 2 in. by 1½ in. in size, which are bolted to the bottom instead of being screwed down.



Ends are offset and run under the scuff iron, preventing them from lifting up. The platforms are equipped with taper pockets heavily ironed at all the essential parts. It has a 5-in. loading plate at the rear and a 3½-in. plate the remainder of the distance, around the body and the sills are reinforced with 2¼ in. x 5/16-in. steel bands.

being started in one section of the department, carried through the departments for the various stages of construction, and turned out at the other end a finished product.

Hard wood is used in the construction of these bodies, reinforced by malleable iron at all the essential points such as the corners, platform and sides. The stakes are also braced with malleable iron. The use of malleable iron has been decided as it is said to be better fitted to stand heavy pressures without bending or breaking. In assembling these bodies, rivets and bolts are used wherever possible. Consideration has been taken in the construction of the body for the creation of smooth and attractive lines avoiding anything that tends toward the clumsy. The bodies and cabs are finished with paint that will stand up under elemental conditions and lettered with an eye on the value of a traveling advertising medium. The cabs are equipped with well upholstered seats.



Sixteen-Passenger Bus Body for Standard Ton or Three-Quarter Ton Chassis.

Built by McKay Carriage Co., Grove City, Pa.

This side-seated truck body, with small wheel house to fit over the fenders, thus giving a roomy job, has a capacity of 16 passengers. It is 12 ft. long, 4 ft. 8 in. wide and 5 ft. 2 in. high. All the windows are of the drop type, sliding into the sides. The interior is finished in natural oak and upholstered in imitation leather. Two electric dome lights provide illumination. The entrance and exit door, which is at the front right-hand side, is operated by an automatic lever from the driver's seat.

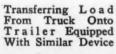
McGarry Lumber Loading and Unloading Device

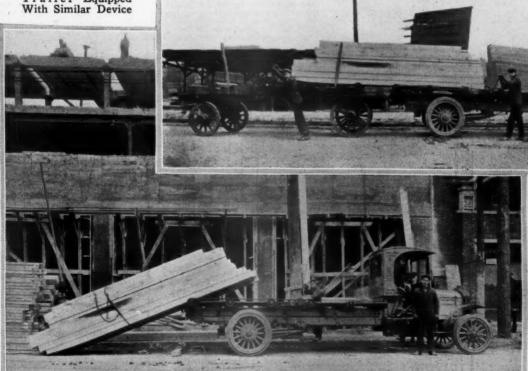
DEVICE that will facilitate loading and unloading in the lumber business, and cut down the cost of hauling to such an extent as to make short hauling no more expensive than a long haul is the product of John A. McGarry Co., 2136-46 S. Ashland Ave., Chicago, Ill. If transfer wagons equipped with this device are employed in con-

nection with trucks similarly equipped, much time in loading is saved, as they may be loaded in preparation of an expected truck, to which it may be transferred in about one minute. Then all that is necessary is to secure the load by binding chains and the truck is ready to leave the yard. When the truck arrives at its destination the binding chains are thrown

off and the load dumped in a few minutes without injury to the lumber. This device is said to transfer and dump the load under any conditions, making no difference whether it is coated with snow or ice, as all the rolls in this device operate in unison, thereby, exerting an even force.

The rolls of this device are made of extra strong steel pipe in the ends of which are lodged 4 in. plugs which are practically welded in place by the heat expanding process. An axis is formed by a 15% in. cold rolled shaft securely keyed and riveted to the plug and pipe so that it will not work loose under any





Showing the Operation of Unloading About to be Completed.

Note the lumber is securely bound by chains to prevent spreading. A clear conception of the working principles of this device can be obtained from these illustrations.

strain. The rolls are carried at the ends by 3-in, crucible steel bearings and are supported in the center by two rolls 2 in. in diam. that revolve in a steel box. The 61/2 in. sprockets on each end of the roll are connected by pintle chains capable of withstanding a strain of 5000 lb, to the other rolls. The entire system is operated between the third and fourth roll by an 18-in. crank which drives a 51/4-in. steel pinion, which in turn intermeshes with a 16-in. cut gear with 134-in. face mounted on the third roll from the rear. This arrangement of gears enables one man to handle from to 7 tons with ease.

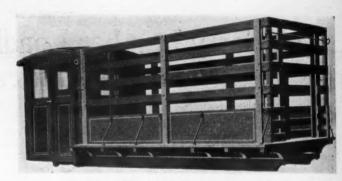
The platform is made in sections that fit between the angles of the frame that carry the rolls. The platform may be easily removed, giving access to the machinery. Two steel I-beams, that project 5 in. beyond the edge of the platform, help form the means of securing the binding chains that hold the load rigidly on the truck. Stakes are not included in the design of this body as they have been found impracticable in the transportation of lumber. If the lumber were piled against them, the swaying of the truck on its springs would break them on the first piece of rough road the truck encounters. But, the substitution of the binding chains at each end, is said to hold the load rigidly to the platform.

This device is furnished with two cranks which when reversed and secured. lock the rolls and prevents any shifting.



Spaulding All-Weather Cab No. 52

The doors of this all-weather cab are of heavy automobile steel, and the windows are removable, enabling the rapid conversion into an open cab for fair-weather use. Built-in, rain vision, adjustable ventilating plate-glass windshield is used. The cab is 60 in. high, 44 in. long and 46 in. wide and, as it is collapsible, it can be shipped in a 30-in. crate.



Spaulding Stake Special No. 105

The above illustration shows one of the many different styles of stake jobs made by the Spaulding Co. to fit standard trucks where special demands require special construction

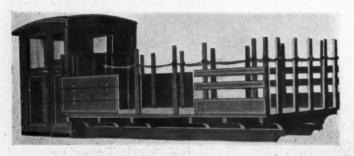
New Spaulding Ford Stake Body No. 105, Built by the Spaulding Manufacturing Co, Grinnell, Ia.

The 62 by 96-in. platform of this job is of hardwood, heavily ironed with wear-irons covering the full length of the floor. "U" bolts are furnished for attaching body to the truck frame. The letter panel is attached to the first three straight stakes on each side of the body, and the balance of the stakes are furnished with chains. The 16, 134 x 2½ x 32-in oak stakes are fitted in keepers along the edges of the platform.



Spaulding Universal Stock Rack Model No. 503

The cab, body and top are one unit adapted to the Ford touring car, and is 46-in. wide and 107-in. long, and the two side panels are 8 and 10-in. high, respectively. The flare-board, which extends from the rear of the seat to the tailgate, is 5-in. wide, and the height of the drop, same as the two panels, which is 18 in. The top is of enameled duck, and the entire cab and body, which is supported by 6 posts and by the windshield support, may be fully enclosed by dropping heavy-oiled duck curtains.





Federal Truck Equipped With Special Box Body Called "Admobile Body"

Body as an Advertising Medium

The Whistle Company of St. Louis, producers of a soft drink, fitted up a truck with an attractive body and sent it on a tour of the country early in January.

A two-ton Federal was fitted up with a completely enclosed box body projecting over the driver's seat and carrying on four sides views of plants of the company from coast to coast.

This "admobile body" has 24 x 10-ft. billboards recessed in the sides which are flooded with light at night. On the top, across the front is an iron frame supporting a transparent screen 6 x 8 ft. The projector for moving pictures is on the rear, thus giving a two-way view of the pictures, which are entertaining as well as instructive. This body was designed and built by C. L. Grigg, advertising manager of this company.

Field Announces New Truck Cabs

HE latest fashion in drivers' cabs is illustrated herewith and has recently been produced by the Field Manufacturing Co., Owosso, Mich. It is called the "Four Season" cab, a name which fits its use particularly well. The outstanding feature is its all-metal

exterior and the durable black enamel finish, which gives exceptional weather-resisting qualities. The cab is a quantity

production proposition, and is composed throughout of flush panels made up sep-

arately and afterwards solidly bolted to-

gether. This gives a very solid and rigid construction. The doors work in rectan-

gular openings, insuring free action. The square shape provides more room for

the driver, and the different panels may

be shipped knock-down within 34 inches,

a big advantage in freight shipment.

A number of other unusual features are incorporated. The glass in doors and side panels are identical in size, being set in removable steel sash with cushion The rear window also is set in steel sash, and may be dropped or removed as desired. A special spring oper-

> Field All-Service In -

> terchange-

able Gate Stake Body

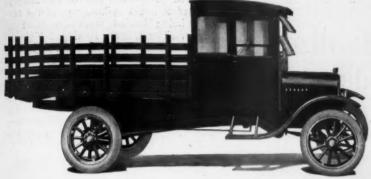
The cab is provided with door in the rear on driver's side, permitting quick access. The rest is inclined to fit driver's back at just the right angle, and the riding cushion has all full-coiled springs, which are especially comfortable.

So durably constructed is this cab that it offers an especially safe investment, as depreciation is very slight. The shape and handsome finish match any style of

body perfectly.

A Solidly Constructed Line for Larger Size Trucks

The aim of the Field Manufacturing Co. in building a line of bodies to fit larger than Ford cars has been unusual solidity, stability and endurance in con-

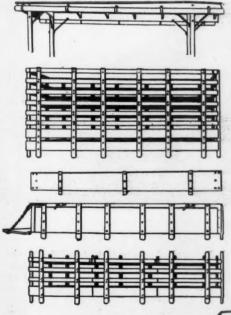


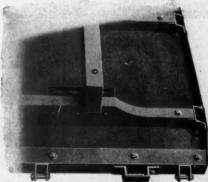
Field Express Body With Running-Boards and Baked Enamel

ating against side of glass panel, and special thumb catches at the top, eliminate rattle whether glass is raised or lowered. The glass may be dropped with struction. All these bodies are made with the Field platform as a basis, this being manufactured under letters Patent No. 383887, granted November 25, 1919, patents having been applied for covering the Field Holding Down Iron, and other exclusive ideas.

The bolster construction is so arranged that the sub-sills are adjustable to fit any truck chassis. Consequently, one style of body only is produced at a saving in cost and of difficulty in mount-

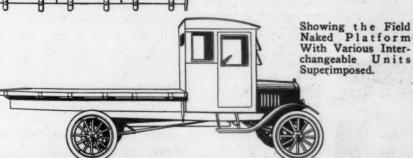
ing:





Close-up of Underneath Bolster Construction

one hand while driving, a very desirable feature. Special rattle-proof latch lock adjusts to any thickness of door jamb. Both panels of the pressed steel windshield are both ventilating and rain vision.





Convertible All-Weather Cab

The special stake pocket ties floor, bolster and guard angle solidly together, and is so constructed that the stake is supported by end of bolster, giving it unusual strength against a sudden shift-ing of the load. The Field platforms are supplied with steel scuff strips, which pass under guard angles, front and rear, and are riveted fast. Consequently, they cannot come loose at either end.

In the Ford size, a 45 x 96 platform is constructed, which, in connection with the new coupe-style Four Season Cab, may be built up into either express body, express canopy or full panel jobs. This platform is provided with outside running board and built-in baked enamel fender,

making a handsome and durable combination.

The next Ford size is 67 x 96, this being an interchangeable all-service body. A 73 x 96 special service body is also manufactured. In sizes for larger cars the 67 x 103 or speed wagon series is constructed; also 67x114 for regular 1-ton trucks, and the 67 x 130 and 67 x 164, which are adaptable to 1½ to 2½-ton chassis.

members. Cable winds on grooved drums apply the lift at the wer front body corners, first directly and then through hoisting arms. This system is said to practically eliminate back pull on the hoist. Fig. No. 6 shows the partial dumping tailgate opening.

The lower inside corners indicated by Fig. 7 are rounded so as to prevent clogging. All rivets inside of the body are countersunk and the sides flared for extra strength. The front side of the body is crowned to avoid spilling any of the material being hauled upon the hoist or chassis. The tailgate is hinged high, so as to increase the dumping clearance. The rigid and adjustable underframe

The rigid and adjustable underframe shown by Fig. 8, permits fitting to any width chassis frame without shop process,

A deep hardwood sill, as shown in Fig. 9, not only strengthens the frame, but also provides a buffer to cushion any shock transmitted to it by the body. The

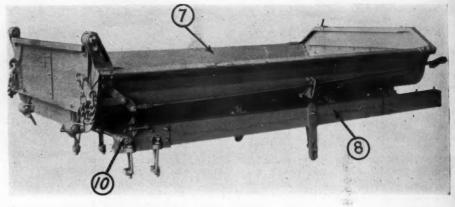
K & J Hoist and Standardized Steel Dumping Bodies

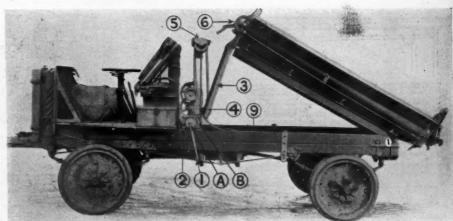
PARTICULARLY interesting product of the Kilbourne & Jacobs Mfg. Co., Columbus, Ohio, is the K & J hand hoist and standardized steel dumping body, and the hoist. These bodies are obtainable with either the automatic power hoist or the hand hoist, and are built in a wide range of sizes, providing a body for practically all services, being equipped for the moving of dirt, gravel, oil, ores and other granulated materials. Provision has been made in an adjustable underframe for the readyfitting to any chassis.

The automatic power hoist is a simple, one-speed transmission, driving a worm, and is used to transmit the engine's power to lift the body, rather than for driving wheels. As a one-speed "lifting" unit, it is said to operate about 1/30 as much as the four-speed driving unit.

The power hoist is driven from the "sliding jaw" clutch on the propeller shaft through a chain. It is indicated in the illustration herewith by Fig. 1. Its operation is controlled by a lever easily reached by the driver. Fig. 2 shows the bracket on the hoist base which provides means of quickly attaching the hoist to the chassis frame. The hoisting arms, Fig. 3. are attached to the lower front corners of the body and to the front I-beam, cross-member by brackets riveted in place. When the body is in a normal position, the arms are retained flat under the body. In dumping they travel over rails leading up to the hoist columns. No stiff arms are said to project below the top of the chassis frame to cause trouble in dumping on uneven ground. The automatic hoisting mechanism, Fig. 4, automatically disengages at the total lift and total descent. This may be disengaged manually at 45 degrees by a worm lock.

After depositing the load the truck may be started while the body is at full dump, as the hoist will lower the body and disengage while the truck is in motion. The hoisting mechanism, which does not in-





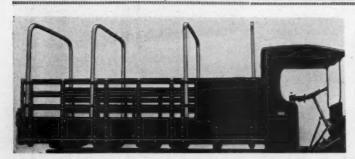
K. & J. Dump Body

Parts entering into the operation of this body are designated by figures in the description

clude pump, cylinder or pistons, is entirely housed in a bath of non-fluid oil.

The overall hoist height is low and always the same, as there are no rising

dumping body is attached to the truck frame at the rear by stout hinges which also tends to prevent side-sway in dumping



Baldwin Standard Model No. 25, Three Section Rack Body. This rack body, built by Baldwin & Sons, Inc., New Haven, Conn, is made in three sections. The lower panels are 10 in. high, and the panels directly above are separated by intervals of 5 in.

Hoists for dump bodies, both power and handoperated, also specially designed dumping apparatus, will be described and illustrated in detail in our May issue. Every dealer should read the May issue.



With Wood Sideboards Removed Platform Body is Formed and if the Tailgate is Lowered, Eighteen to Twenty-Four Additional Inches is Added to the Length of the Body.



Showing One of the Removable Side-boards, Which Are Built in Two Sec-tions, in Place. But One Man is Re-quired to Make These Changes.



Showing the Lower Sideboard in Place. This Form is Adaptable for Hauling Sand, Gravel and Similar Heavy Material.





By Adding the Upper Sideboards to the Lower it is Adapted to Haul Light Bulky Material Such as Coke, Coal, Etc. Model HH-1 Horizontal Hydraulic "All Purpose" Steel Dumping Unit, Fully Assembled, With Lower and Upper Sideboards Raised in Position for Dumping.

In this view may also be seen the horizontal hydraulic hoist which operates on the leverage principal. The power of the lifting arms is exerted directly against the rollers on the underside of the body which is approximately under the center of the load. Hoisting strains are distributed over 5 ft. of the chassis frame directly above the rear axle and springs. This body and hoist is manufactured by the Horizontal Hydraulic Hoist Company, 35 25th St., Milwaukee, Wis.



Model HH-2 Horizontal Hydraulic Dumping Unit Mounted on a Five-Ton Chassis

Built by the Horizontal Hydraulic Hoist Company, Milwaukee, Wis. This body is designed especially for the hauling of hot asphalt and has an inner lining of asbestos between two layers of sheet steel. The dumping angle, which is 45 degrees, insures a clean discharge of the load despite its viscous character.



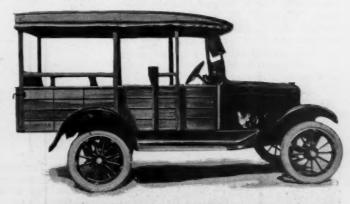
Model HH-3 Horizontal Dumping Unit Mounted on a Four-Wheel Drive Chassis

Ruilt by the Horizontal Hydraulic Hoist Company, Milwaukee, Wis.
This body is built for hauling builder's material and, as may be noticed from the illustration, the body has square corners and straight sides, tapering wider at the rear to insure a clean discharge.



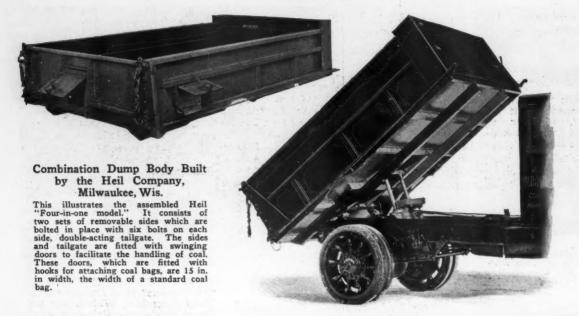
Illustrating a Special Garbage Dumping Unit Manufactured by the Horizontal Hydraulic Hoist Company, Milwaukee, Wis.

This body is made of non-corrosive metal. The rear end of the platform tapers at an angle of about 15 degrees upward to a point level with the extended upper surface of the sides. This construction is designed to facilitate a complete and clean discharge of garbage.



Passenger Body for Overland Suburban Service. the J. T. Cantrell Co., Huntington, N. Y. Built by

This interurban transit body was especially designed for Ford, Overland, Chevrolet and Maxwell chassis. It has panel sides and a canopy top supported by six posts. Entrance may be gained through two doors, one in the front for the driver and in the center for the passengers. It is provided with side curtains, rear curtains and an adjustable windshield.



Showing the Heil Four - in - One Steel Combination Dump Body Raised in Position by Hydro Hoist tion by Hydro Hoist
This job is mounted on a 5 ton Clydesdale truck.
In this instance two sets of the removable sides are employed with double-acting tailgate. In order to utilize all the available space, the Hydro hoist was selected so that every inch of available space could be used for the body, which fits up against the rear of the cab, increasing the body length from 1 to 1½ ft.

Meckel Special Bodies of Large Design

accompanying shows three special designs manufactured by Fred I. Meckel, 9-11-13 E. 13th St., Chicago, Ill. A very particularly interesting body design built by this company is a unique job con-

with vehisote panels and enameled white. Illumination is provided by electric lights which obtain their power from a generator. Two jacks, which are permanently attached to the lower compartment on the rear of the body and which spring

> Wire Screen Type Body, With a Glass Panel Type Cab on a 11/2

Ton Packard

Chassis.

out of the way when not in use, are provided to relieve the strain on the tires and

springs when truck is not in practice.

The body built for the Brogsky Gross & Co., illustrated herewith, is a body of the canopy top stake type, mounted on a five-ton White chassis. The length overall of this body is 14 ft., width 6 ft. and height 6 ft. Two panels 36 in. wide extending the full length of the body, make up the front sides. The remaining lower section of the sides consists of a lower panel 24 in. high. Entrance to the interior of the body may be obtained by removing the stake section above the panel and part of the lower panel from either side of the middle. The body is protected from side collisions by bumper sills which are reinforced with 3/8-in. irons. floor is protected against wear by heavy strap irons. A glass panel type of cab is used, fitted with a built-in adjustable windshield.

The remaining illustration shows a wire screen type of body mounted on a 11/2-ton Packard chassis. This body is also equipped with a cab of the glass



structed for the Chicago Tuberculosis Institute, and is mounted on a 34-ton G. M. C. chassis.

This huge van has the following dimensions: Nine ft. 3 in. long, 6 ft. wide, 54 in. high. When on the road this body is entirely closed, daylight being admitted through windows located along the upper edges of both sides of the body. They are easily opened and retained in an open position by a special patented device. The driver's cab is separated from the main compartment by a sliding door. The driver's seat is so constructed that when the back is lowered a bed 6 ft. long, 22 in. wide is formed for use on long trips. The upper section of the cab is utilized as a storage compartment, which opens into the interior of the body. Storage space also provided in the rear, underneath the body, 6 ft. long, 14 in. high and 24 in. wide, is supplied with doors into which entrance may be gained from the outside of the body and is equipped with locks. The interior of the body is lined



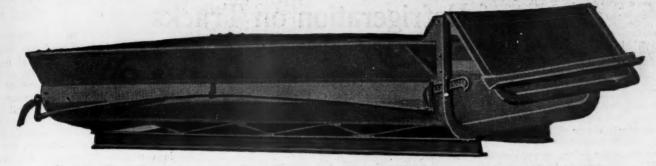
Special Body Built to Meet the Needs of the Chicago Tuberculosis Institute.

Canopy Top Stake Body Mounted on a Five-Ton White Chassis.



panel type with built-in windshield and is 10 ft. 2 in. long, 5 ft. 3 in. wide on the inside and 5 ft. 6 in. high. The side panels and gate are 20 in. high, the side panels being protected by a 2½-in. bumper sill, also reinforced with oval irons. Easy

access to the interior of the body is provided by folding steps on the inside of the end gate.

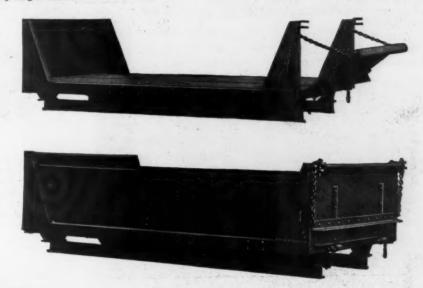


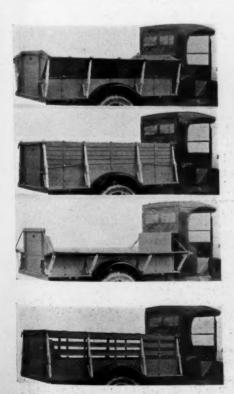
Standard Wood Dump Body, Type W-3, Built by the Wood Hydraulic Hoist Company, Detroit, Mich.

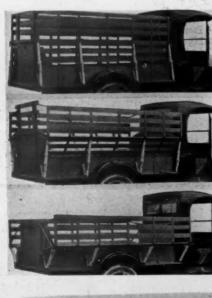
This standard all-steel body is a utility truck for all kinds of material. As the illustration shows the corners of the body are curved to the extent of a 6-in radius, which permits free discharge of material, preventing wet material such as clay, etc., from sticking in the corners. The top of the sides are also provided with a flare or projection approximately 12 in. high and extends about 5 in. beyond the width of the body. This is claimed not only to strengthen the body but to replace the floor by the use of the 6-in. radius at the bottom. The body is mechanically controlled from the driver's seat, and after the load has been deposited it returns to its normal position and the tailgate closes and is locked at the driver's seat. This body is made in sizes 8, 9 and 10 ft. in length, 4 x 6 ft. in width and to any height desired.

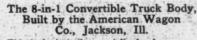
Wood Combination Body Type H-1

The body has been adopted by the Wood Hydraulic Hoist & Body Co., Detroit, Mich., as a standard combination body. It has removable sideboards of steel and malleable stake pockets placed in the bottom of the body on each side for the insertion of wood stakes when necessary. When the sides are removed this body can be used as any other stake body for hauling freight, or other materials, and also can be used for hauling loose material by replacing the sideboards. Owing to the width of the body, and the fact that it does not have radius curve, the sub-frame has been raised slightly higher than ordinarily. This makes it 12 in. from the bottom to the top, eliminating any danger of any part of the body touching the wheels when loaded to capacity. This body is made in sizes 8, 9 and 10 ft. in length, 4, 5 and 6 ft. in width, and height to capacity required.









Co., Jackson, Ill.

This body is built especially for farm service, and is made in various sizes. The feature of this proposition is that the eight bodies are furnished in one, while the range of sizes permits the use of this body on any make of motor truck from 34 ton up to 3 ton capacity. The eight designs provide style required for every kind of farm work and transportation. The body illustrated is mounted on an Oldsmobile 34 ton economy truck. It is 9 ft. in length and 45 in. in width, and has a capacity of 51 bushels of grain. The weight of the body is 690 lb. The large illustration shows the flat rack with the scoop-board down, his position being adapted for hauling fruit and vegetables, freight, baled hay, etc.



A-B-C Automatic Brine Circulation System of Refrigeration on Trucks

B. FITCH, president of the Motor Terminals Co., New York, in a recent address stated a large saving annually would result to consumers if motorized terminals were installed in every large city for the handling of freight by motor truck. Similar terminals are now in operation in Cincinnati and, according to available statistics, says Mr. Fitch, great economy in handling freight has been and is being noted.

Incidentally, in the building up of the motor-truck industry for the purpose of transportation, there is a necessary demand for an efficient means of refrigerating transportation for perishable commodities.

With the automatic brine circulation introduced by the A. B. C. Transit Refrigeration Co., Chicago, Ill., a consistent

the principle of a refrigerator freight car for the transportation of perishable goods. Any sort of perishable commodity may be transported in this type.

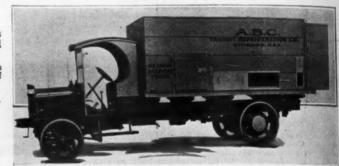
A distinct feature of the A. B. C. job is the fact that brine cannot come in contact with the chassis under any circumstances, which practically means doubling the life of the truck and adding to its efficiency.

Another feature of the A. B. C. trucks

head pipes are shut off and live steam forced into the brine tanks through pipes extending downward on the sides of the walls under the floor and returned to the tank. The principle of operation is precisely the same as when ice and salt are used, in that the heated brine is caused to circulate by the swaying motion of the vehicle, automatically, and is kept in constant circulation. Any temperature required can be maintained

A-B-C Ice-Cream Truck on Packard Chassis.

Note, these trucks built on any make of chassis



This Truck Can be Used for Transporting Meat, Fish, Milk, Vegetables or Other Perishable Commodities. throughout an entire trip without difficulty. The temperature throughout is uniform and does not vary in different portions of the body.

From a sanitary standpoint, the advantage of having the entire body enclosed is recognized at once. Flies and other pests and the elements are absolutely insured against. Contamination is



temperature can be maintained. This system is simply constructed and easily operated.

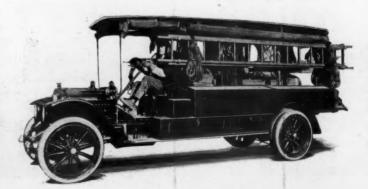
Briefly, the system consists of a brine tank constructed within the body compartment of the truck to be refrigerated. The tank is divided in the center by a partition that contains three check valves. Ice and salt, in a proportion determined by the temperature desired, are placed in the tank which produces an extremely cold brine. This brine is caused to circulate by the swaying of the truck while in motion, through pipes that hang about two or three inches below the ceiling of the compartment, and extend from one side of the tank under the roof to the opposite side. The brine, seeking to equalize its level and being unable to pass back through the check valves into the other section, flows through the pipes and is then carried to the opposite section automatically. The longer the truck is in motion the colder the brine becomes, although it is possible to maintain an even temperature if so desired.

Two types of refrigerated motor trucks are being built by the company—one for use by ice cream manufacturers, constructed as follows: A compartment for ice cream, one for customer's ice, another for salt, and a fourth for empty cream containers. The other type is termed the "General Utility," and is constructed on

Ice-Cream Truck Built for the Hydrox Company, Chicago, With A-B-C System Installed.



is that they can be changed with little additional expense from a refrigerator to a heater. When used for heat, the overimpossible. If the user or consumer of your products can be given this guarantee his trade will be permanent.



Electric Service Body

This body, manufactured by B. W. Baldwin & Sons, Inc., New Haven, Conn., is fully equipped with all the essential parts making for an effective electric service truck. All available space is utilized to best advantage.





Two Views of the Armleder Model 8-W 21/2 Ton Truck Equipped With Covered Stake Type Body, Showing the Side Curtains Removed and in Place

This removable side curtain is a feature that facilitates loading and unloading in the furniture moving business and is being used to great satisfaction by the Granada Transfer Company, Cincinnati, Ohio. Pianos or other large and heavy pieces of furniture can be loaded from either side or the end, affording three points of approach, permitting of loading or unloading under almost any adverse condition.



Armleder 2½ Ton Tractor Equipped With 5 Ton Heavy Trailer Used by the Kroger Grocery and Bakery Company, Cincinnati, Ohio

This outfit distributes groceries and bakery goods to a large chain of Kroger stores in Cincinnati and vicinity



Armleder Model H-W 2½ Ton Truck With Passenger Body.

Built by the O. Armleder & Co., Cincinnati, Ohio

This body, which extends over the rear fenders, provides sufficient space for the comfortable transportation of passengers. Entrance and exit is made through a door provided with two steps on the right-front side of the body.



Armleder Model K-W 31/2 Ton Truck and Troy Trailer. Built by the O. Armleder & Co., Cincinnati, Ohio

This trailer is equipped with a passenger body and is used for transporting the employees of the Proctor and Gamble Company, Cincinnati, during the early and later periods of the day, and during the intervening hours it is used for hauling freight, as it is readily converted into a large box body by removing the portable seats. The body cover is of the open type and is provided with side curtains.



A Rack Body for Hauling Fruit and Vegetables Mounted on a Reo Truck

This truck and body is in the employ of R. V. Huff & Son, Lansing, Mich. As may be seen from the illustration, every available bit of space has been utilized, even the running-boards provide a resting place for baskets of fruit.

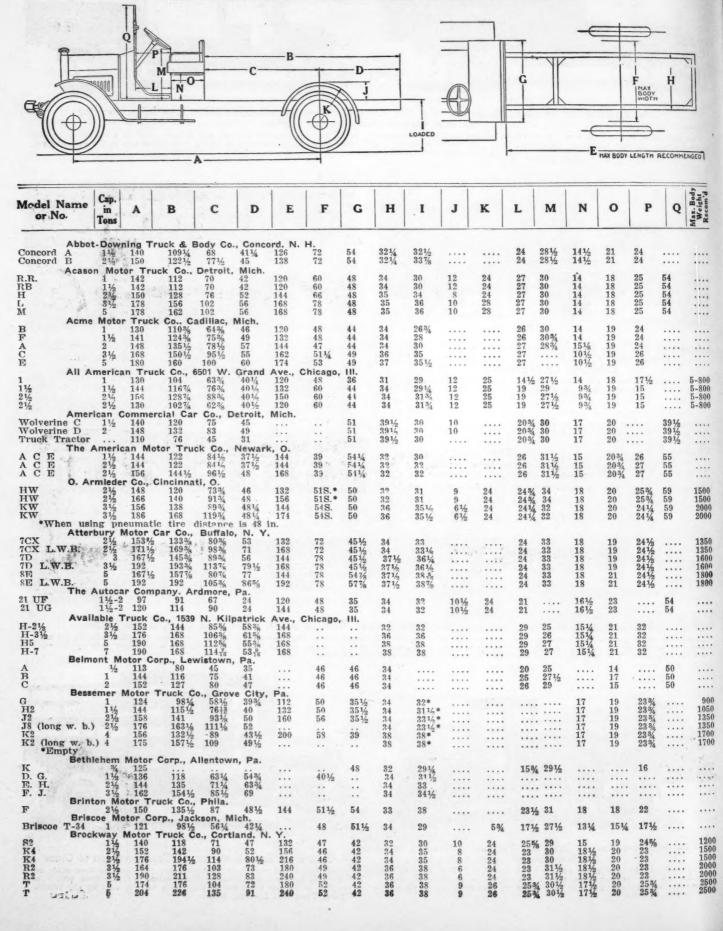


Showing a Rack Body for the Transportation of Glass

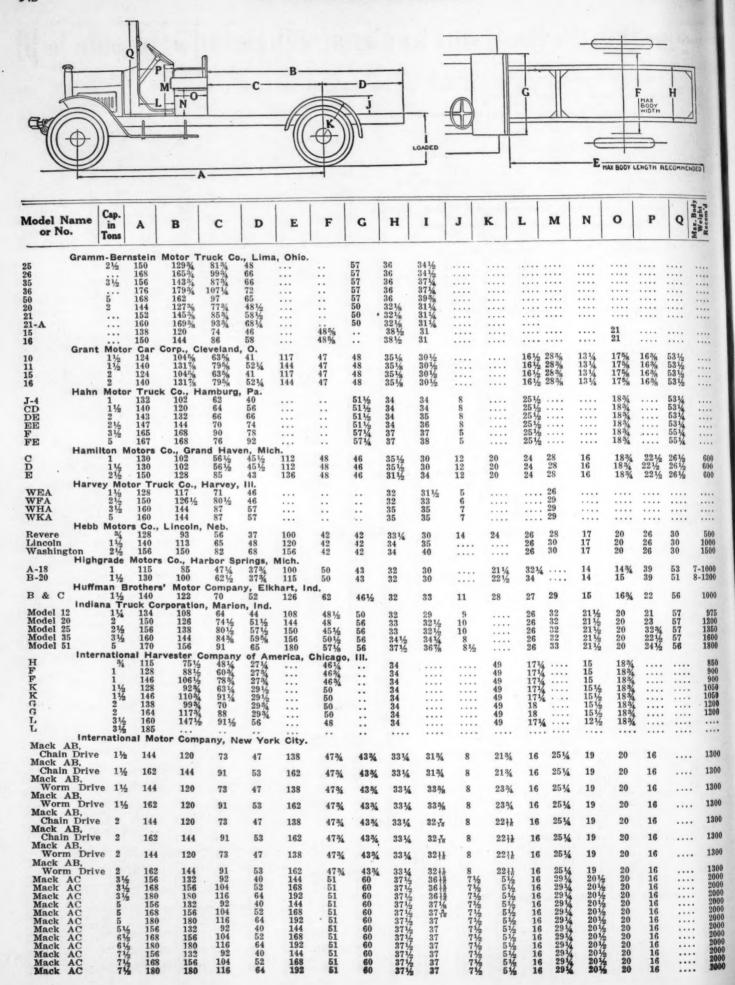
This body is mounted on a Reo truck and provision has been made on the body for the assemblying of canopy supports at any time, which are carried at the top when not in use. This body is used by the Wilcox Silver Plate Co., Lansing, Mich.

Table of Chassis Dimensions for Body Builders

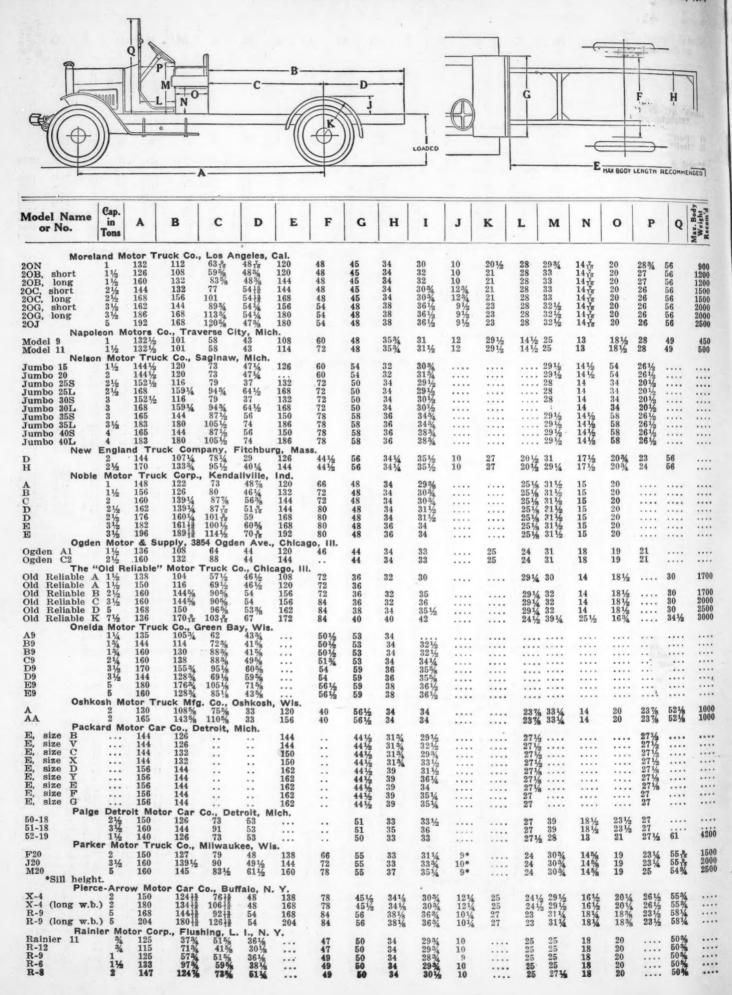
Note: Where figures are omitted under columns J, K and Q, it denotes that rear fenders and windshield are not furnished with chassis



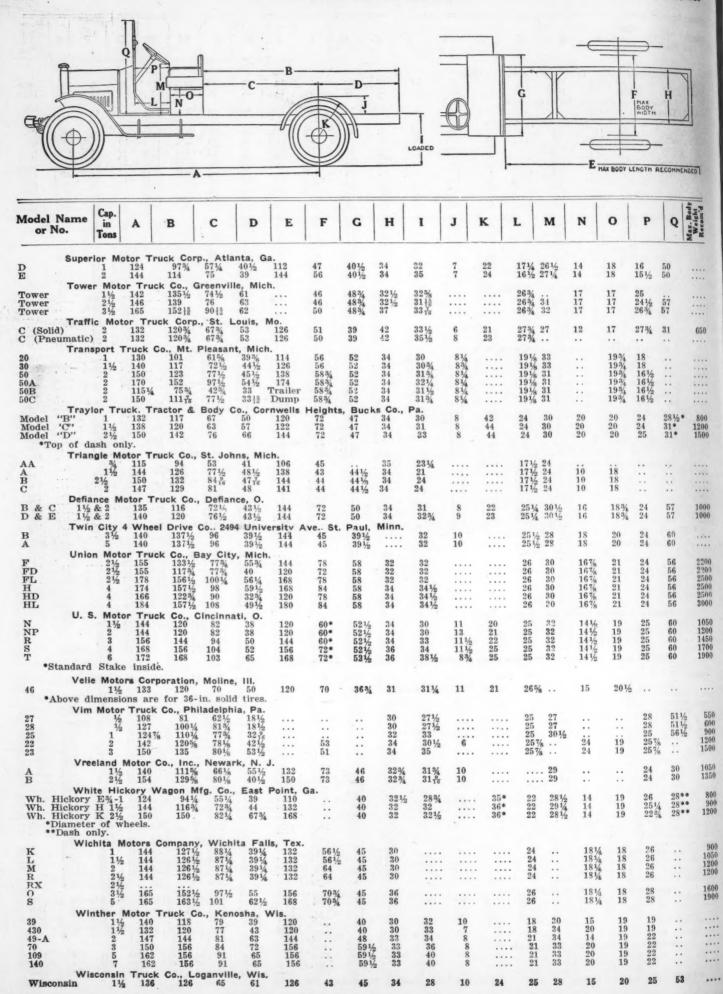
odel Name	in A	В	C	D.	E	F	G	н	I	J	K	L	M	N	0	P	Q	Max. Bod Weight
00	11/2 130	ck & Trac	59	43	alo, N.	Y. 72	Opt.	36	28		23	30	22		14	27		100
Chevro	1 125	Co., New 1071/4	591/2	46	Diese	46%	361/2	351/8	261/8	8%	21	24 1/2	301/8	15	161/2	231/2	53 5	***
Chicago 14	Motor 7 1½ 144 2½ 156	ruck Inc., 123 135	741/2	48½ 48½ 48½	Place, 132 156	Chicag	0, III. 48 48	32 32	32 32		23 23	26 26	28¾ 28¾ 28¾	14 14	18½ 18½		****	
Collier	31/2 168	180 ruck Co., 106		86 , O.	180	47	48 50	36¾ 35	34½	9	23 221/2	26 27	28%	14	18½ 18½ 19	21	58	
odel 19 odel 20	1½ 144 2 152 da Motor	120 132 Truck &	76 77 Trailer (44 55 Co., Po	136 146 ntiac.	47 46 Mich.	50 50	32 32	31 -	8	22 1/2 22 1/2	27 27	30 -	18 18	19 19	22 22	58 58	
	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	128 114¾ ile Co., Gar	85½ 77¾	43	12 10	48 48	52 52	$\frac{32\frac{1}{2}}{32\frac{1}{2}}$	32¾ 30			$23\frac{1}{2}$ $23\frac{1}{2}$	30 30	15 15	20 20	24 24	****	
met 1 & 11/2 1	-1½ 130 mmerce !	102 Motor Car	58	44 /, Detr	120	48	48	36	26	11	16 .	26	171/2	14	17%	101/2	44	10
•	1 126 1½ 134	100	53 62 Henderso	39 38	120 120 C.	46 46	54 54	34 34	$\frac{28}{30\frac{1}{2}}$	11 11	231/4	23 % 23 %	26½ 26½	13½ 13½	20 20	25 25	51 51	10
A	5 178 3½ 178	160 160	115 104	45 56	172 168	56 53	55 51	38 35	37 351/2	8	27 27	23½ 23½	25 27	17 17	18 18	25 25		
	2½ 148 2 148 1½ 140	138	85 85 78	55 52 48	$146 \\ 128 \\ 128$	50 50 52	51 51 51	35 35 34	$\frac{32\frac{1}{2}}{33}$	8 8 7	27 27 25	23½ 23½ 23¼	271/2 271/2 27	17 17 17	18 18 18	25 25 25		
Dart T	1 130 ruck & T	105 ractor Cor	68 poration	37 Wate	111 rioo, la		51	34	321/2	5	211/2	231/2 231/2	27	17	18	25		
To top of	1 130 1½ 140 2½ 150 3½ 160 dash only	113 124 144	64 76 81 84	37 37 43 60	120 126 144 156	51 51 501/2 571/2	36 36 42	34 34 34 38	33 33 34 38	7 8 6	40 40 42 44	22¼ 22¼ 27 27	22 23 24	16 16 16 16	18 18 18 18	27 27 25¼ 25¼	24 24* 25½* 30*	10 10 12 13
Dearbo	rn Truck 2 148 1½ 136 1½ 124	Co., 2015 129% 109% 97%	80¾ 65% 53%	48% 43½ 43½	144 126 114	47 48 48	34 34 34	32 34 34	28¾ 27⅓ 27½	10 10 10	2134 201/2 201/2	24 24 24	28 27¾ 27¾	16 16 16	18 18 18	24 ½ 25 25	27 27 27	
Denby	1 124 2 143	98 1/4 127 1/8	57% 76%	Mich. 401/2 503/4		50 % 54 ½	341/4 341/4	34 34	28 5/8 31 1/4	$^{16}_{12}$	23 23	24 24	28 % 28 %	15 15	19 19			1
0	3 149 4 170 5 170	140	82½ 87 87	59% 53 53	* * * *	59 55	34¼ 55¾ 55¾	34 34 34	31 34½ 36½			24	30% 30%	15	19 19 19	• • • •	****	1 1 1
Depen	1½ 128	ck and Tr	actor Co		144 180	111. 72 72	46 46	33	31 31	8	43	241/2	29	17 17	19	241/2	54	
Diamo	2½ 157 nd T. Mo 1½ 144	tor Car Co	ompany,		W. 26th	St., Ch		HI. 34	31%	8	43	24 1/2	301/2	14	187	24 1/2	54	1
1	1½ 154 2 160	132	80 1/4 86 1/4 92 1/2	51% 45% 50	• • •	46* 46* 49*	34 34 37	34 34	31% 33 38			23 3/4	301/2	14 14	18 78 20 20	201/4	****	
Between w	3½ 170 5 180 heels.		98%	58		49	50	37 37	38	****		24 % 27 %		15 14	181/2	27% 28%	,	7
Dispat	ch Motor		40	0 14th 10	Ave., S	E., M	inneap 44	olis, Mi 30	nn. 30	6	11	24	21	7	15	24	40	
odge Bus. Car	1/2 114	etroit, Mic 47% ar Co., St.	391/8	8 Md.	72	47	47	38					26¾	• • • • •		17%	5018	
4	2 144 2 163	1 124¾ 2 142¾	78% 96%	46%	132½ 156	:	54 54	34 34	32¼ 32¼	8	22 22	25 25	32 32	16 16	21 21	25 25		1
7	3½ 156 3½ 176 3½ 196	4 1491/3	91½ 111½ 131½	33 38 48	132 156 204	:	54 54 54	36 36 36	35¾ 35¾ 35¾	8 8	26 26 26	25 25 25	33¼ 33¼ 33¼	16 16 16	21 21 21	26 26 26		1 1
*6 to 7 ft.		ompany, L						34	33			24						
	Motors 1½ 13	Co., Oakla				• •	48	30		9		241/	33		1914		57	1
√a √a	2½ 14 17: 3½ 15:	2 180	81 109 89%	54 71 591/2	**		48 48 5014	34	31½ 31½ 36	9		24 1/2	31%		18%		57	1
72	17 19	2 161¼ 0 191¼	107¾ 125¾	53 1/2 55 1/2	• • •		501/4	1.							18%		57	
	5 15 17 19	2 1611/4	89% 107% 125%	591/2 531/3 551/2	• • •	• •	50¼ 50¼ 50¼	37%	37	9	****	26	301/2		18%	****	57	
Famor 10 12	1 Trucks	, Inc., St. 0 94	Joseph, 52				49 49	451/2 451/2	31¼ 31¼			24 24	26 26		18	24 24		
tandard "B"	1 1/2 13 Wheel Di 3 12	8 116 rive Auto 4 136	Co., Clir	tonvil 39	le, Wis.	411/4	36	36	37	4	23	201	27	261/2	18 30½	2114	36	1
pecial "B" pecial "B" pecial "B" Garfo	3 13 3 14 3 15 d Motor	6 148 8 172 6 196 Truck Co.,	109 121 141 Lima, O	39 51 55	148 172 196	411/4 411/4 411/4	36 36 36	36 36 36	37 37 37	4 4 4	23 23 23	20 ½ 20 ½ 20 ½	27 27 27	26 1/2 26 1/2 26 1/2	30½ 30½ 30½	21 1/2 21 1/2 21 1/2	36 36 36	
5 0H 7D 8	2 14 31/2 16 5 12	4 121 2 144½ 8 150	96	38 47 56 54	108 120 144 168	• •	50 52 591/4 56	34 34 36 32	32¼ 33 34 36	,		26 26 26	31¼ 32¼ 32¾ . 31½	• • • •		26 26 28 411/4	****	
L	Motor Tr 21/2 14 21/2 17 31/2 16 31/2 19	5 156	79 106	50		51½ 51½		34 34	31 % 31 %			223	6	17 17	. 18 18			-
CTL.	$ \begin{array}{ccccccccccccccccccccccccccccccccc$	8 184	86 122 99	62 62 69		55¼ 55¼ 57½	• •	36¾ 36¾ 39	36 1/4 36 1/4 38 1/4	****		23 23 25	* * * * *	17 17 17	20 20 20			
IL Gener	5 19		115	77	ich.	571/3	* *	39	3814			OF		17	20		****	
6 1A 1B	1 13 1% 13	2 89 0 101	57 58	32 43	96 120	46 49	46	33	27 30,	121/2	22 22	26 25	25¾ 32½	15 181/6	20 20	27 26	****	
1A 1B	2 14 2 15	4 125%	85%	53 54 64	144 144 168	49 45 45	46 46 46	33	311/2	10	231/2	25	321/2	181/4	20	26		63
TIA TIB	3 1/2 23 3 1/2 28	8 144 6 192	1151/2	54½ 78½	168 192	5134 5134	46 46	38	341/2	11	26	25	32%	18%	20	26	***	913
101A 101B	5 23 5 28		1151/4	54 1/2 78 1/2	168 192	51% 51%	46 46	38	36	10	26	26	32%	181/4	20	26	No technical	-



lodel Name or No.	Cap. in Tons	A	В	C	D	E	F	G	н	1	J	K 1	L	M	N	0	P	Q	Max. Bod Weight
fack AB Trace fack AC Trace fack AC Tr fack AC Tr fack AC Tr *Height of	7 10 13 15 5th V	120 119 119 119 119 119 Wheel	77 87 87 87 87 7 Turnta b	49 55 55 55 55 55	28 32 32 32 32 32	0 0 0 0 0 0 0 0 0	47% 51 51 51 51	47 60 60 60 60	33¼ 37½ 37½ 37½ 37½	31¾ 40⅓ 37⅓ 40⅓ 42	8* 7¼* 7¼* 7¼*		16 16	20 29 ¼ 29 ¼ 29 ¼ 29 ¼	19 20 ½ 20 ½ 20 ½ 20 ½ 20 ½	20 20 20 20 20 20	16 16 16 16 16		
"Bell" Truck	2 1 1/2 akee A	132 utomo	Compai 127 107 obile Com	52 pany,	55 Kankak		47 47	49 49	33 33	26 26	7½ 7½	27 27	23	27 27	16 16	20 20	22 22	54 54	
fodel E Kelly hain Dr K-31	Spring	170 gfield 144	Motor Tr 141	98½ ruck Co 85¾	50 ., Sprii 55 &	168 ngfield, 141	39¾ O. 72	421/2	32		11%	23	281/4	311/2	141/2	1914	25% 25	651/2	15
Vorm Dr K-3: D. K-35 V. D. K-36 D. K-40 D. K-45 D. K-50 D. K-60	2 1½ 2½ 2½ 3½ 4 5	144 144 150 150 150 150	141 141 141 145 145 145 145	85¾ 85¾ 85¾ 81 81 81 81	55 1/6 55 1/8 55 1/8 64 1/4 64 1/4 64 1/4	141 141 141 145 145 145 145	72 84 84 96 96 96 96	42 ½ 46 46 46 46 46 46	34 34 38 38 38 38	32½ 33½ 33½ 39½ 39½ 39½	10 10 10 10 8 8 10 10	24 25 25 27 27 27 27 27 27 27 27 27	20½ 20½ 20½ 22¾ 22¾	35 34 37 37 37 37	15 1/2 15 1/2 17 1/2 17 1/2 17 1/2 17 1/2	22 22 22 23 23 23 23 23	25 25 25 26 26 26 26 26	57½ 57½ 57½ 57½ 57½ 57½	10 13 13 16 17 18 19
7	1	135	108 uck Co.,	Vagon I 66 Los A	42	132 Cal.	ville, K	42	36	34			22	27	16	18	23	. 55	* *
L EL ED XL		144 159 173 156 170 156 175	135 1/2 128 1/2 152 1/2 152 3/4 152 128 171	70½ 76 90 86 100 86 107	67 52 ½ 62 ½ 66 ¾ 52 42 76	· · · · · · · · · · · · · · · · · · ·	• • •	44 ½ 50 50 50 50 50 50 50	34 34 36 36 36 36	35 36 36 41 41 41						* * * * * * * * * * * * * * * * * * *		53 57 57 57 57 57	• •
ton ton	Zeitle 2½ 3½	150 156	144 144	87 87	57 57	144 144		48 48	32 36	34 37	9 10	25 27	26 26		20 20	20 20		30 30	
ne ton	1 1½ 2 2½ 3½ 5	130 143 153 160 163 180	120 132 144 150 156 168	72 88 96 99 108 159	48 44 48 51 48 57	480 Fols	om St.	48 48 48 48 48 48	Francis 34 34 34 34 38 38	co, Cal. 33 35 35 35 35 38			24 24 24 24 24 24 24	30 31 31 31 31 31	15 16 16 16 16	20 20 20 20 20 20 20	24 24 24 24 24 24 24	58 58 58 58 58	
H. J.	11/4 11/2 21/2	131 137 162			field, N 43% 43% 55%		46 46 46	45 45 50	34 34 34	27½ 28 30	12½ 12 12	23 23 24	24% 24% 26%	26¾ 26¾ 28½	147% 147% 165%	18% 18% 19	24 1/2 24 1/2 24 1/2	27% * 27% * 30¼ *	
			108 120 149 1241/2 1681/2	66½ 81½ 99½ 80 106 98¾	Bingha 41 1/2 38 1/3 49 1/2 44 1/4 62 1/2 53 1/4	120 144 168 144 192 180	N. Y. 47 481/2 50 58	52 1/2 52 1/2 52 1/2 52 1/2 52 1/2 52 1/2	34 34 34 36 36 36	29 32 32 35½ 35½ 36	9 9 9 9 9	24 24 24 24 24 24 26	18 18 18 18 18	29 30 1/4 30 1/4 30 1/4 30 1/4 31 1/4	121/2 121/2 121/3 121/3 121/4 121/4	19 19 19 19 19	28 31 31 31% 31% 29	531/4 531/4 531/4 541/4 541/4	1 1 1 1 1 1 1 1
	n 2½ n 2½ n 2½ n 3½ n 3½ n 3½ n 3½ n 3½	Moto 144 156 168 180 147 171 171 183 147 171 147 171			Detroit 47 53 77 53 43 45 61 45 61 45 61 45 73 42 43 45 73 42 44 44 62 47		86 86 86 86 86 86 86 86 86 86 86 86	42 42 42 42 46 46 46 46 46 46 46 46	38 38 38 39 39 39 39 39 39 39 39	41 41 39 41 41 41 41 41 45 46 39 39 39			25 25 25 25 24 % 24 % 24 % 24 % 24 % 24 % 24 % 24 %	34 1/2 34 1/2 34 1/2 34 1/2 34 1/2 34 1/2 34 1/2 34 1/2	16 16 16 1734 1734 1734 1734 1734 1734 1734 1734	18 18 18 19 19 19 19 19 19 19	25 25 25 25 23 1/2 23 1/2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		
ker Standar	mobile	Com 150	pany, Ma 144	In St., 91	Bridge, 53	port, Co 144	nn. 78	50	38	33			231/		17%	20	251/3		
w. b.) ker (extra	3&4	170	180	111	69	180	78	50	38	33				32	17%	20	251/2		
long w. b.) Loui M. C. 2-20	siana	Motor	216 Car Co., 143	131 Inc., S 87½	85 hrevepo	216 ort, La.; 168	78 Cedar 39%	50 Grove, 561/2	38 La. 32	33	11	26	231/2	331/4	17%	20 14	251/2	****	
BL	erne N	lotor	Truck Co	63	erne, M		44	45	34	30	12	24	20	26	14	20	20	52	
	1 1½ 2½ 3½ 5½	138 150 162 174 186	0., Scrant 117% 128% 143% 157% 167	69 1/4 76 1/4 83 1/4 95 1/4 102 %	48 51% 60% 62% 64%	120	• •	••	33 34 34 34 37 <u>1/4</u>	31 33 34 35 37		* * * * * * * * * * * * * * * * * * * *	23 1/4 25 25 25 25 25	27 26 26 26 26 26	13% 15% 15% 15% 15%	19 20 20 20 20 20	25 1/2 29 29 29 29		
W M V V V C (Tractor) AL BL *All dime	1½ 1½ 2½ 2½ 2½ 2½ 3¼ 5 5 ensions	142 144 170 144 170 110 158 194 170 194 from	7214 147% 183% 162% 186% top of	73 73 745 100% 745% 1005 405 8134 1173 1173 frame	abash 44% 44% 55% 42% 55% 31½ 66 66 74 74 to top	Ave., Ch 144 144 144 183 144 183 of whee	icago,	34 34 34 34 34 34 45 45 45	34 1/6 34 1/8 34 34 34 34 36 3/4 36 3	30 30 30 30 30 30 30 30 30 36 36 36 36 38 34 38 34	4* 55% 55% 55% 33% 13%		26 26 26 26 26 26 26 25 7 25 7	29 1/4 29 1/4 28 28 28 28 28 28 30 3/4 29 4 29	1414 1414 1414 1414 1414 1414 16 16 16 16	181/8 181/4 181/4	22 7/8 22 7/8 26 3/8 26 3/4		
daxwell	11/2	124 124	101%	56%	51 45	114	67 48	36 38	36 36	27½ 29P 27½S	36 9P 71/2S	21 19S 201/2F	24 25 25 25	30 291/2	20 13	20 ½ 18 ½	24 27%	54 51	
Hurryton Men	1 1 1½ 2 3½	130 144 160 160 160	122 146 155	Co., Me 64 77 93 91 91	nomine 40 45 53 64 65	e, Mich. 108 126 150 156 162	••	50 50 50 52 52	32 32 32 36 38	31 36½ 36½ 37	6 1/2 6 6 6	23 23 23 23 23 25	273	33 . 33 33 4 321/4 31	17 17 17 17 17	191/ 191/ 191/ 191/ 191/	26 26 264		



Model Name	Cap.	A	В	С	D	E	F	G	н	1	J	K	L	M	N	0	P	Q	Max. Body Weight Recom'd
10A 20B	1½ 2½	150 156	121 127	73 80	on, Wi	8. 131 131	50 50	37 37	32 32	31 32	12 15	23 26	23 23	31 31	18 18	21 21	23 23	50 50	900 1500
Taganow	34	128	Lansing 96 Co., Lan	571/2	37½ Pa.	96	46	401/2	30	28	17%	23¾	26	2914	14%		26		***
B. S. W. G. S. W. H. W.	1½ 2 3 3 4	133 118¼ 140 162½ 158½ 170 156 184½ 169 190¼	114 90 125 146 143 152 150 181 155	73 58 81 106 99 111 97½ 126 108½ 129½	41 32 44 40 44 41 52½ 55 46½ 55	120 108 144 156 156 168 168 198 168	47 49 ½ 49 ½ 47 ½ 47 ½ 59 62 62	52 52 52 52 52 52 52 52 52 52	33 33 33 33 36 36 38 ½ 38 ½	31% 30% 30% 31% 29% 32% 32½ 33¼ 33¼	10% 13½ 13½ 13½ 12½ 145% 17½ 10½ 14¾ 14¾	25 26 26 26 26 29 26 26 28 28	23 23 23 23 23 23 23 23 23 23 23	32¼ 33¼ 33¼ 32⅓ 30¾ 31 31 32¼ 32¼	17% 17% 17% 17% 17% 17% 17% 17% 17% 17%	19 19 19 19 19 19 19 19 19	24 21 ¾ 21 ¾ 21 ¾ 23 ¾ 25 24 24 21 21	60 ½ 60 ½ 60 ½ 60 ½ 60 ½ 60 ½ 60 ½ 60 ½	1200 1800 1800 1800 1800 2000 2000 2500 2500
	1 1½ 2 2½ 3½ 5	Truck 128 128 132 132 158 168 168	108 108 124 124 132 132 132	68 ½ 68 ½ 84 84 86 86	38 38 40 40 46 48 48	12 8th A 112 112 132 132 138 140 140	48 48 54 54 60 68	42 42 42 42 42 43 43 44	k; Fac 34 34 34 34 36 36 36	31 1/4 31 1/4 32 1/4 32 1/4 32 1/4 33 1/4 34	6 6 8 8 8 10	23 23 24 24 24 26 26	24 24 24 24 25 25 25	28 28 28 28 28 28 ½ 28 ½ 28 ½ 28 ½	18 18 18 18 18 18	18 18 18 18 18½ 18½ 18½	23½ 23½ 23½ 23½ 23½ 24 24		
GG M	W Moto 1 1½ 2 2½ 3½ 5	120 136 150 165 175 175	96 120 132 143 144 144	Chicago 50 ½ 67 81 86 96 96 Syracuse	53 51 57 58 58	• • • •	50 50 50 50 54 55½	45½ 45½ 47% 51% 51%	34 34 32 32 37 37	33½ 33½ 33 38 39 43	31/4 21/4 3 3		26 26	351/2 351/2 38 39 39	••••	18 18 18 191/2 191/2	26½ 26½ 26½ 26 26 26		***
W 25 W 25 W 35 W 50	2½ 2½ 3½ 5	156 174 174 174	$126\frac{1}{2}$ $144\frac{1}{2}$ $145\frac{1}{2}$ $145\frac{1}{2}$	82 1/2 100 1/2 97 1/2 97 1/2	• •	144 168 168 168	44½ 47½ 49 55	50 50 50 50	35 35 35 35	32 32 35 371⁄4			26 ½ 26 ½ 26 ½ 26 ½	2 30½ 2 30½	****	20 20 20 20 20	$26\frac{1}{2}$ $26\frac{1}{2}$ $26\frac{1}{2}$ $26\frac{1}{2}$	****	1350 1500 1600 1800
Selder 1½A 1½A-11 2½A-14 3½A-12½ 3½A-16 5A-12½ 5A-16	Truck 1½ 2½ 2½ 3½ 3½ 5	137½ 145 165 162 190 164 192	114 134¼ 170¼ 153 195 153 195	71 79¼ 99¼ 89 117 89	7. 43 55 71 64 78 64	114 134½ 170¼ 153 195 153 195	• • • • • • • • • • • • • • • • • • • •	45¾ 45¾ 45¾ 45¾ 45¾ 45¾ 45¾	34 34 37½ 37½ 37½ 37½	32 33¼ 35¼ 35 % 39	101/4 9 7 7 7 9	23 24 24 24 24 26 26	23 7 25 25 25 25 25 25 25	3434 3334 3334 3334 2334 33 33	171/2 167/8 167/8 167/8 167/8 167/8	175% 20 20 20 20 20 20 20	23 % 25 25 25 25 25 25 25 25		1000 1350 1350 1600 1800 1800
220 81 86 571 101	1 1½ 1½ 2½ 3½ 5 3½ 12 x 9	or Truc 137 150 150 160 171 171½ 171	109½ 121 121 131¼ 150¼ 145¾ 145¾	Wabash 70 1/2 81 81 91 1/4 104 1/2 100 1/2 100 J—15; F	39 40 40 39 % 45 % 45 1/4 45 3/4	120 132 132 156 168 168 168 1—351/6.	49 49 47 49 50 52 51	45 52 52 52 52 52 52 52	34 34 34 38 38 38	28 29¾ 31¾ 31½ 34⅓ 37% 34⅓	11½ 11 13 11 7 8½ 7	23 23 25 25 25 25 25 25 25 36		31%	16 16% 16% 16% 16% 16%	20 20 \$\frac{1}{2}\$ 20 \$\frac{1}{2}\$ 20 \$\frac{1}{2}\$ 20 \$\frac{1}{2}\$	26 23½ 23½ 24¾ 26¾ 25¼ 26¾		90 105 105 120 160 180 160
	1 Moto 1 1½ 2½ 2½ 2½ 3½ 3½ 5			75 75 76 106 89 125 93			0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	45 45 45 45 48 48	34 34 34 34 38 38 38	29 30 30 30 36 36 36			22 22 22 22 22 22 22 22 22		1716 1716 1716 1716 1716 1716 1716	22 22 22 22 22 22 22 22			
56 76 66 86	1 2½ 3½ 5	134 140 160 160	120 122 144 144 npany,	62 78 79 94 94	52 % 43 50 50			· · · · · · · · · · · · · · · · · · ·	32 32 38 38	35 35½ 39 41 South,		, Wash	25 25 25 25	31¼ 31 31¼ 31¼	••••	20 20 20 20 20	25 25 25 25 25		
Model "W"	2	164	121	89	. 32	144	51	43	311/2	33	7	25	24	28	151/2	18	221/2		12
Std. Wheel-B Long Wheel-B Std. Wheel-B Std. Wheel-B Long Wheel-B Long Wheel-B Long Wheel-B Long Wheel-B Dump Tractor Std. Wheel-B Long Wheel-B Long Wheel-B Dump. Vt. Hs Dump. Hor. F Std. WB. Ch L'g WB. Ch L'g WB. Ch Dump Chain Tractor Chair St. WB. Ch Dump Chain Tractor Chair St. WB. Ch Dump Chain Tractor Chair St. WB. Ch St. W	1122222333555555577772 Mon. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.	142 156 174 130 162 162 162 168 179 192 148 174 192 148 148	120 Con 120 138 128 128 138 167 185 1224 1284 158 182 128 16 182 128 16 182 110 110 110 110 110 110 110 110 110 11	70 84 70 84 102 58 58 85 85 91 115 97 115 71 97	50 54 56 56 57 57 59 67 37 61 67 39 44 67 39 44 67 39 44 67	Rogers 132 150 150 150 150 150 150 150 150 150 150	70 70 75 75 75 75 75 75 75 75 75 75 90 90 90 90 90 90	48 48 48 48 48 58 58 58 58 58 58 58 58 58 58 58 58 58	Wis. 333/42 333/42 333/42 34 34 34 38 38 38 38 38 38 38 38 38 38 38 38	31331556444457663331314477666355776			25 25 25 25 25 25 25 25 25 25 25 25 25 2	% 322 % 322 % 322 % 366 % 366 % 366 % 366	171464444444444444444444444444444444444	21 21 21 21 21 21 21 21 21 21	277 277 227 227 227 227 228 228 228 228	44444444444444444444444444444444444444	
Pneumatic 8 Pneumatic 9 Pneumatic 7 Pneumatic 10 Pneumatic 11	111/2	130 140 156 185 110	rp., Buf 99½ 119¼ 132¾ 163¾ 77¼	58% 66½ 79% 100	Y. 411/8 523/4 535/8 633/4 35	100 120 144 180 84	45 44 44 52 471⁄2	51 51 51 58 471/2	32 32 32 32 32	30 1/4 33 35 1/2 40 1/2 26 1/2	11 12 12¼ 13¼ 12¼	28	20	14 30 4 14 30 4 14 30 4 14 30 4 25 4	15½ 15½ 15½ 15½ 15½ 11¾	1834 1834 1834	201/2	54 57	7 11 13 14 6
B D F *Windshie	11/2	140 140 155	120 120 126 shed on	70 70 81	50 50 45	144 144 150	Opt Opt Opt der. S	47 47 47 pecial	34 34 36 dimens	33 34 36 sions fe	or cab		27	33	17 17 17	20 20 20	24 24 24	:	10 12 12



Martin-Parry Bodies for the Ford Model T Standard Chassis and the One-Ton Worm Drive Chassis. Built by the Martin-Parry Factories, York, Pa.



NO. 202A: This fancy "Vehisote" body with its swell sides and rear is an exceptionally fine example of the body builder's art. It is strongly constructed, well braced and handsomely finished in black enamel with gold striping. Other distinctive features are bevel edge plate-glass windows in sides and rear, and large brass handles on either side of driver's compartment. Made in two models—202A, as above. 202B, with fore door—one side stationary.



NO. 201A. Designed primarily for light delivery service. The construction includes hardwood frame and attractively finished straight side "Vehisote" panels. Rounded front roof and oval windows on each side of driver's compartment add much to its appearance. The double rear doors, equipped with a patented anti-rattler fastener, provide an opening 44 ins. wide, 54 ins. high. Inside length of body, measured from back of driver's seat, is 96 inches. This body also is made in two other models; one with full fore doors and left side stationary; the other with full vestibule front for winter use.



No. 200C. Combines sturdiness and good looks. Its frame work is of selected hardwood, rigidly braced and reinforced with special irons at all needed points. The pleasing lines of its "Vehistote" panels, the highly attractive finish, enamelled in dark green, each contribute to its high quality and distinctive appearance. Built in three models. No. 200C as above. No. 200B with full fore doors and No. 200A with open front. Each model 60 in. long and 44 in. wide, inside measurements, and provides a rear opening 54 in. wide and 58 in. high.





NOS. 454C AND 454A. An enclosed panel body for the Ford Truck Chassis for year-round delivery service. For winter use the enclosed front vestibule provides perfect protection for driver and load. It can be quickly and easily converted into a semi-closed or open front body for spring or summer service. Inside body dimensions are length, 96 in.; width, 44 in., with a floor to roof space of 59 in. Rear opening, fitted with double doors having oval plate-glass windows and anti-rattler fasteners, gives an opening 54 x 59 in. Frame and sills are made of selected hardwood, well ironed and braced at all joints. Side panels are "Vehisote" finished in dark green enamel. The No. 454A body interior is properly slatted to protect side panels from injury. Draw irons are on every post. Rear doors, with oval windows and anti-rattler fasteners, provide an opening 44 in. wide and 54 in. high. Body length inside from back of seat is 96 in. Also built in two other models—one with fore doors, the other with full vestibule front.

Babcock Stake Platform Bodies and Cabs

HE Babcock line of heavy-service truck bodies manufactured by the H. H. Babcock Co., Watertown, N. Y., is well-represented by styles 62, 62 C, and 62 M shown herewith. These bodies not only incorporate high-grade material, but are also the product of thorough workmanship. The platforms are constructed of hardwood protected by oval band irons bolted through to cross bars. The platform sills are of selected northern-grown oak and ash strengthened on the upper and under sides by two wide steel angles, welded and hot-riveted at the corners making an angle steel as solid as the chassis frame. The four-foot chamfered stakes are equipped with shoulder irons at the bottom and fit snugly into stake pockets punched through top and bottom steel angles and mortised between cross angles.

All the essential points are reinforced in such a manner to overcome any strain that may be subjected to them. For



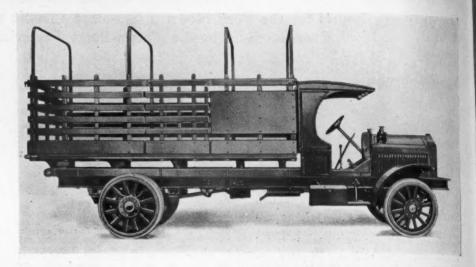
example: Ash cross bars 1 x 5 in., reinforced on the edges by angle steel, are placed opposite each stake pocket to strengthen the floor between the bolsters and prevent the platform from spreading and equalizing any strain on the stakes by distributing it clear across the body. The floor joints are protected by steel and securely bolted through every cross bar, tending to make the floor integral with the frame, thereby resisting strain on the body and wear on the floor.

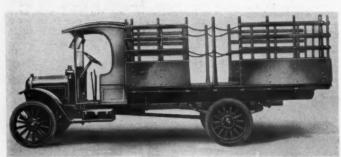
These bodies are built with loading space from 10 ft. 6 in. to 18 ft. 6 in. long by 6 ft. to 6½ ft. wide.

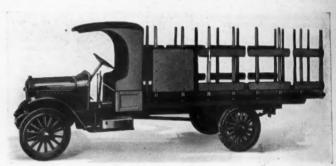
Using the same platform for a base, stake panels and canopy top with side curtains, etc., are furnished to produce a number of combinations in addition to

those illustrated herewith. A new style cab designated as type "C" is a recently developed style. It is 51 in. wide, outside, and is adapted for use on the seat base of any standard chassis, although it is furnished with a base, if desired. The windows of this cab when opened swing up and fasten inside against the roof. Upholstered spring cushion seats and back rest and driver's storm curtains are included in the equipment.

Three Views, Showing Three of the Most Popular Babcock Models Right, model 62; lower right, model 62C, and lower left, model 62M









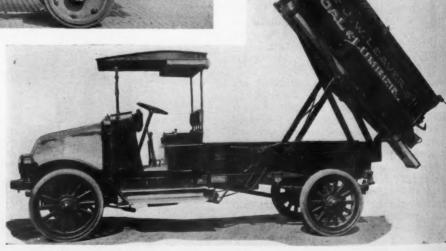
Two Ton Moore High-Lift Coal Body; Type HLP2. Built by Edwin A. Moore, Reading, Pa.

Moore, Reading, Pa.

This body is built in 1, 2, 3 and 4 ton sizes, adaptable to all makes of chassis and may also be utilized in transporting sand, gravel, etc. When this body is raised two operations are performed simultaneously—that of raising and that of tipping at an angle. The maximum angle is 60 degrees. These bodies are protected and reinforced by a heavy gage sheet steel on the inside, floor, sides, front and back. The tailgate is equipped with detachable hinges, permitting the entire gate to be opened up or removed if necessary. A large spout, a 45 degree deflector for chuting the coal out at an angle with the body in the event of not being able to back the truck up to the curb and hooks for hanging the bags are included in the equipment. The bodies are also equipped with division boards, dividing the body into two one-ton compartments, and a 2 section 20 ft. galvanized chute.

Illustrating the Hilo in Operation

New elevating and dumping apparatus, which incorporates a system of levers acting on the scissors principle, recently brought out by the Lee Loader and Body Co., 2343-2350 S. LaSalle St., Chicago, III. It is known as the Hilo. This body is adaptable for dumping viscous material such as concrete and asphalt, and also has vast possibilities as to coal hauling unit, in view of the fact that it permits material to be chuted across the sidewalk and lawn. If mounted on a 15 ft. wheelbase chassis the maximum height that the tailgate may be raised is 8½ ft.



Gravity Actuated Dump Bodies Manufactured by Transportation **Equipment Company**

The Transportation Equipment Co., Detroit, Mich., is manufacturing a line of dump bodies which are operated by the force of gravity. Included in this line are both side and end dumps, also side dumps for drop-frame trailers.

loads may be discharged without requiring the driver to leave his seat.

The operation is as follows: the driver pulls the handle, which is attached to the chain, and, in turn, connected to the automatic hook bar, releasing the hooks

the body to return to its normal position. The distribution of the weight on the rockers produces this action. The tailgate automatically locks itself at the same time. The tailgate also automatically unlocks when the body reaches the dumping position. This operation is either automatic or by hand at the will of the oper-The latter method of operation is especially desirous if the body is divided into two or three compartments where each compartment is discharged separately into the skip of a mixer on a road or paving job. A maximum angle of discharge of 45 deg. may be obtained.



Showing the Transportation 'Equipment, Gravity-Operated Body at the Discharging Angle With Tailgate Open

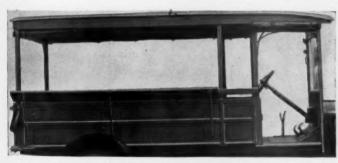
One of the features of the end-dump which hold the body in its normal carrying position. The body then slowly is the dispensation of mechanically operdumps by gravity and the hook bar ated hoisting mechanism, at the same time retaining the advantages common to any travels back on the ratchet catch memend-dump body. The ease with which bers which hold the body in its dumped the dump body may be removed from position until the driver pulls the same the truck and replaced with a stake or handle and releases the hook bar from platform body is another feature. the ratchet catch members, which permits



Included in the Line Are Both Side and End Dumping, Also Side Dumps for Drop-Frame Trailers

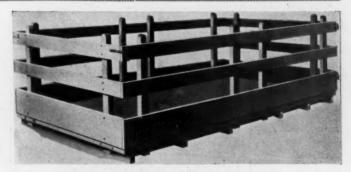
The side dumps of this line are built in single hoppers from 11/2 to 6 yds. capacity, to fit any chassis and end dumps are also built in any sizes to fit any chassis. They are built of steel material from 3/32 to ½ thick, according to capacity and service for which they are used.

This company also builds barrel racks and special metal bodies to adapt motor equipment to special work.

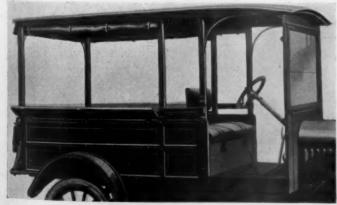


Canopy Top Express for Model B, One-Ton Ford Truck. It is Known as Model No. 35

It consists of 18 in. panels, 7 in. flareboards, short-chained tailgate and side and back curtains



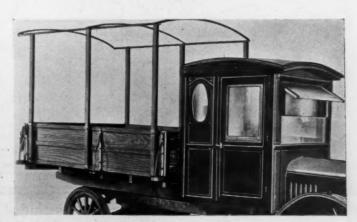
Platform Stake Body Built for Trucks From 3/4 to 3-Ton Capacity



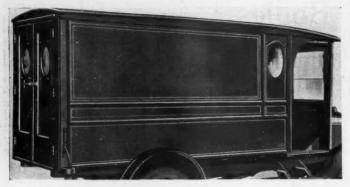
Canopy Top Express Body for One-Ton Ford Truck, Model No. 90. Built by the L. C. Graves Co., Springboro, Pa.

The 45 in. by 90 in. body is equipped with 18 in. panels and 7 in.

flareboards and short-chained tailgate. It is also equipped with side and back curtains



L. C. Graves Special Furniture Job This body, which is 50 in. by 90 in., is made up of 18 in. panels and detachable pipe rack



The Panel Open-Front Raised Body, Model No. 105 for One-Ton Ford Truck

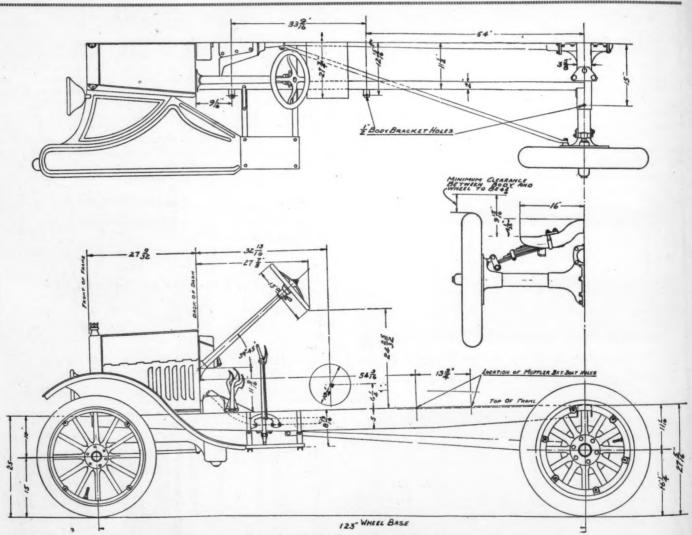
Showing the L. C. Graves Three-Passenger Cab Built to Fit Any Make Truck From Three to Five Tons in Capacity.



This Body, Model No. 55, is Built for Any Truck From Three to Five-Ton Capacity

L. C. Graves Regular Open Type Knock-Down Cab, Model No. 71





The Ford One-Ton Truck Chassis

The accompanying illustration shows an assembly drawing of the Ford truck chassis with the principal dimensions for body designing. These dimensions apply regardless of the type of body attached

This review of Special Bodies will be concluded in our next issue and will contain such descriptions and illustrations that were received too late for this issue



EDITORIALS



Is the Automotive Industry the Goat?

Lawmakers throughout the country seem to take a particular delight in singling out the automotive industry when it is a question of raising additional revenues for one purpose or another. The motor truck industry has been most unfortunate in this respect, and no matter what State legislature meets, it is usually called upon to take action on bills which would increase motor vehicle registration fees. These fees range from \$10, for the light delivery car, to as high as \$1000 for the heavy duty truck. The passenger car is not overlooked as a revenue product, but the rates are not as overburdening as in the case of a commercial car.

Recently there was formed at New York what is known as the Motor Vehicle Conference Committee with headquarters at 7 E. 42d Street, and which includes six organizations: the American Automobile Association, Motor and Accessory Association, National Automobile Chamber of Commerce, Inc., National Automobile Dealers' Association, Rubber Association of America, Inc., and the Trailer Manufacturers' Association of America. This committee has for its object to review various bills which are being brought up throughout the country with the idea of placing before the lawmakers full and accurate information upon which they can base motor truck laws. It is impossible for this committee to do all this work single-handed, and it is, therefore, necessary that individuals and organizations in the various states co-operate in this work. This committee is urging upon the constituent members of the six organizations that they continually and insistently urge upon their lawmakers the need of passing such legislation which is fair to the motor truck and of helping to defeat such legislation which is drastic and too restrictive in its character.

When it is considered that during one week ending with March 20th, a total of nearly 800 motor vehicle bills have been introduced into the legislatures of 14 states, which either have held or are now holding regular or special sessions this year, one can get a slight idea as to what is going on in our state legislatures. A great many of these bills are for the purpose of increasing registration fees. This committee stands squarely behind the schedule of registration fees, provided for in the "Proposed Uniform Vehicle Law," believing them to be fair to the motor vehicle owner and sufficient to fulfill

in any state their logical functions of the maintenance of the main improved thoroughfares. This organization is issuing monthly bulletins in which the various bills and measures have been carefully gone over with suggestions for either endorsing or opposing such bills.

It is up to every dealer, repair man; in fact, any one connected with the automotive industry, to do his part in helping to fight some of the senseless measures which are being proposed. A great many of the lawmakers are not acquainted with the facts and, we believe, that if more accurate information is given them the less the chances are that these bills will be passed.

The association is strongly opposed to bills which require the renewal of operator's licenses; to sizes and weights of motor trucks, less than those stipulated in the Proposed Uniform Vehicle Law; bills requiring motor vehicle operators to take out indemnity bonds; regulation of business, price publicity; taxes on gasoline, etc. The more of such bills passed the more hardships will be placed on the industry with the result that the motor truck business cannot develop as satisfactorily as it naturally should in relieving the country's transportation difficulties.

Are you going to do your part in this work, or are you going to let George do it?

The Truck Dealer's Opportunity

THERE has never been a time when the future of the motor truck dealer appeared more assured than it does today. So many avenues of usefulness hitherto hardly suspected are opening to the motor truck, and the modern commercial car is so completely measuring up to every demand made upon it, that it would be a pessimistic dealer indeed who would today discount the future of this great business of merchandising motor truck transportation.

Any observing person who travels much is impressed on every side with the deplorable condition of railway rolling stock throughout the country. With traffic demands at a maximum, the railroads are forced to handle it with equipment almost without exception badly in need of repair.

During the time the railroads were under government control, nothing was done to provide for the future traffic needs of the nation. On the contrary, it fell short of replacements alone, in round numbers, by 100,000 freight cars, 4,000 passenger cars and 2,000 locomotives, virtually no passenger cars, in fact, having been bought or planned for since the war.

The "Railway Age-Gazette," an authority, recently stated that the roads of the country would need fully 800,000 freight cars to care for transportation demands in the next three years. Yet freight cars take much steel to build, and where is new "Precious" metal coming from? And cars cost twice as much today as they did before the war. Where is the money to come from?

Already the motor truck is taking over transportation in emergencies where the railways have fallen down. Kansas farmers were glad to ship their wheat to the nearest elevators this winter via motor truck, when the railways said they could not give them cars.

No city of real size these days but has its motor truck lines radiating in all directions into the rural districts. No metropolis but dispatches hundreds of tons of merchandise daily to surrounding smaller town merchants who have tired of the slow local freight service, grudgingly given by the railways. No real farmer who daily sees motor trucks speeding along the road in front of his farm but looks forward to the time, soon, he hopes, when he will be rolling along those roads in his truck, rather than plodding along behind his slow team.

Scarce a month out of government control the railroads are already planning a 20 per cent to 25 per cent freight rate increase. More freight for the motor trucks.

Few states in the union but are already spending the first appropriation from millions at hand for new, hard-surfaced roads. Each succeeding year will see more thousands of miles added to the road total. And motor trucks multiply fast on hard-surfaced roads.

What a future! The motor truck dealer who can't see his work cut out for him in this business has a poor vision indeed, and had better make way for some real business man who has vision. Success cannot fail the dealer who builds honestly, who builds constructively, and who merchandises transportation along proper business lines.

Twenty-Seven New York Trucking Companies Combine

The incorporation in New York State last December of the United States Trucking Corp. with a capitalization of \$2,000,000 of 8 per cent. cumulative preferred stock of \$100 par value, and 80,000 shares common stock of no par value, and the provision for a sinking fund of 4 per cent, per annum, is an event of the first magnitude in the motor truck freighting business. The combine has acquired the business assets (except certain warehouse properties) and the good-will of twenty-seven representative trucking concerns operating in the New York City metropolitan district.

These concerns, or their predecessors, have been in business for periods varying from twenty to eighty years, the average being about forty years, and they handle in the neighborhood of 80 per cent. of all the heavy trucking in New York except household furniture, fixtures and retail coal.

The equipment of these companies is for the most part of the same general character and the consolidated corporation will be in a position to mobilize any or all of the trucks in rendering particular services required at any one time.

It is confidently expected that the placing of the various concerns under one management will result in increased efficiency and important economies.

Before consolidation each concern was obliged to maintain a foreman and a number of men at every railroad and steamship terminal. Under one manage-

ment one foreman at each terminal will be able to do the work now performed by several and the number of employees at each terminal will be greatly reduced. Instead of the trucks of each concern taking partial loads to and from the various terminals the work will be so arranged by the consolidated corporation that the trucks will be loaded to full capacity, and in most cases the trucks will be able to secure return loads instead of coming back empty. Similar economies will be effected in the general trucking throughout the city. The consolidated corporation will also handle sufficient business at each terminal to warrant the installation of modern loading equipment, thereby eliminating considerable labor. economies will also be effected in the purchase of equipment and supplies, and in repairing equipment of all kinds, including trucks, harness, blankets, etc., as well as in building and painting trucks, and making new equipment, economies will also be effected in horseshoeing, and motor truck repair and maintenance. The number of stables, garages and depots will be reduced, effecting considerable

It is a well-known fact that trucking business conditions in New York have been for many years about as bad as anything could be. Many protests have been made and Government, State and City officers have been trying to find a solution of the problem of how to lessen the evil.

James J. Riordan is president, and vicepresidents who are not directors are: E. R. Lowe. James Thompson, John Halvey, Jos. Gilroy and Howard Logue.

Motorized Freight Can Save \$45,000,000

An annual saving of \$45,000,000 to consumers in New York City would result with the installation of motorized terminals for the handling of freight, similar to those now being operated in Cincinnati, according to B. F. Fitch, president of the Motor Terminals Co., New "It's New York's only hope," adds Francis Lee Stuart, a prominent consulting engineer. "With unlimited financial resources the engineering talent of this country can quickly solve the freight handling problem," says Mr. Fitch. "Ideal joint terminals at a cost of \$50,000,000 to \$500,000,000 are possible in all of our principal centers, but present chaotic conditions considered, who would assume the responsibility of such abnormal financing? Realty values would be disrupted, possible financial ruin to establishmanufacturing innumerable ments built in suburban localities, etc. For this reason each present terminal layout must be continued substantially as at present."

The Motor Terminals installation at Cincinnati consists of overhead rails, electric cranes, motor trucks, and a plurality of interchangeable motor truck bodies.

It now costs \$300,000 per day to move 20,000 tons of freight from Manhattan to Staten Island and Jersey, and 30,000 tons from these points to Manhattan. The possible economy now wasted in present practice is reflected in the retail value of every commodity. No wonder the cost of living in Manhattan is

News of the Trade in Brief

(For Factory Items, Personals, New Incorporations, Etc., See Pages 106-114)

The S. A. E. Summer Meeting

The 1920 Summer Meeting of the S. A. E will be held at Ottawa Beach, on Lake Michigan, June 21 to 25, inclusive. Monday, the first day, will be devoted to standards and business. Tuesday sees the Fuel session; Wednesday, Transportation; Thursday, Farm Power, and Friday brings the Production session. The program is arranged for one professional session each forenoon, an afternoon daily for sports and recreation, and an evening lecture, and dancing.

Motor Vehicle Exports

Exports of motor vehicles for January, 1920, as reported by the Bureau of Foreign and Domestic Commerce, Washington, included the following commercial cars and their value: to Norway 35, \$75,-694; to Sweden 73, \$110,947; to Turkey in Europe 47, \$47,790; to England 419, \$656,190; to Canada 91, \$164,176; to Mexico 65, \$79,527; to Cuba 69, \$177,027; to British India 29, \$84,841; to Dutch East Indies 76, \$161,979; to Philippine Islands 46, \$80,482.

Dealers of New Jersey Organize

The dealers of New Jersey, truck and passenger car, have effected a State organization which is known as the New Jersey Automobile Trade Association. It comprises the automobile trade associations of the State and has among other objects the betterment of the trade and the correction of trade abuses. Each local association will retain its identity but all will co-operate in obtaining sane legislation.

At the meeting of organization the following officers were elected for the ensuing year: President, John L. Brock, Trenton; vice-president, F. L. Brodhead, Atlantic City; treasurer, Ralph D. Earle, Hackensack; secretary, Harvey S. Moore, Trenton. The annual meeting will be held the first Tuesday in May.

New Factory for Keystone Motor Truck

The Keystone Motor Truck Corporation, headed by H. B. Harper, the newly elected president of the N. A. D. A., expects to occupy its new factory, now being built at Oaks, Pa., by April 1st. The executive, selling and purchasing offices will be at 42d and Chestnut Streets. The Keystone Corporation has taken over the assets of the Commercial Car Unit Co., Philadelphia, and plans to manufacture a one and a two-ton truck. M. S. Cooper is vice president, in charge of sales, C. W. Binns is treasurer, Allan N. Mann, secretary. The directors are J. Kearsley Mitchell, H. B. Harper, M. S. Cooper, P. I. Harper and A. E. Nash.

Commercial Truck Company Builds on Fifteen-Acre Site

The Commercial Truck Co. has been incorporated and has acquired all the assets of the Commercial Truck Co, of America. Fifteen acres have been secured on the North Penn branch of the Philadelphia & Reading R. R., near Hunting Park Ave., Philadelphia, where a modern plant for the production of the Commercial Electric truck will be immediately built.

The N. A. D. A. reports that cars may now be driven from Detroit to New York by way of Toledo, Cleveland, Youngstown, Beaver Falls, Pittsburgh, Bedford, Gettysburg, Lancaster, Philadelphia and Trenton, and that good time can be made over these roads The Chambersburg-Gettysburg road is good, and the mountains are practically clear of ice, and the entire surface hard, except a few hundred vards near McConnellsburg.

Coming Events

- May 5 to 8, 1920—Anaheim, Calif. First Annual Orange County Show, Passenger Cars, Trucks, Tractors, Accessories. Walter W. Biddick, Mgr.
 May 6 to 8, 1920—Macon, Ga. First Annual, Passenger Cars, Trucks, Tractors, Accessories. W. T. Waters, Mgr., care Grant-Waters Co.
 May 6 to 8, 1920—Macon, Ga. First Annual, Show, Passenger Cars, Trucks, Trailers, Tractors, Accessories.
 October 6 to 8, 1920—Northampton, Mass. Annual Automobile Show, H. F. of H. Agricultural Society, Three-County Fair Grunds. A. J. Morse, Secy.
 October, 6 to 16, 1920—New York. New York Electrical Exposition, three floors, Grand Central Palace, includes Electric Passenger Cars, Trucks, Industrial Trucks, Batteries. George F. Parker, Mgr., 124 West 42nd St.

Society of Automotive Engineers

Society of Automotive Engineers
New York City, N. Y. Society of Automotive Engineers. Coker F. Clarkson, Sec.,
29 W. 39th St. Summer Conference, Ottawa
Beach, Mich., June 21 to 25, inclusive. First
day, Standards Committee meeting. Last
four days technical sessions in forencon,
recreation and sports in afternoon, lecture,
and dancing in evening.

CONVENTIONS

- CONVENTIONS

 Atlanta, Ga., May 4 to 7, 1920—Joint Alabama, Florida, Georgia and Tennessee Convention and Exhibit of the Southeastern Retail Hardware and Implement Association. (Auditorium-Armory.)

 Del Monte, Calif., May 30 to June 5, 1920—Mid-Summer Convention of the A. E. A.

 Detroit, Mich., April 29 to May 1, 1920—American Gear Mfrs. Assn.

 Hot Springs, Ark., April 12 to 17, 1920—United States Good Roads Assn., Eighth Annual Convention; also Fourth Annual Convention, Bankhead National Highway Assn.
- sn. Francisco, Cal., May 15 to 20, 1920—San ancisco Seventh National Foreign Trade Francisco Sevenu.

 Convention.

 Foreign Events
- Foreign Events

 Antwerp, Belglum—May 15 to June 13, 1920. International Exhibition of Motor Cars. June 26 to July 25, 1920—International Exhibition of Commercial and Agricultural Tractors, Camions and Motors. August 1 to September 15, 1920—International Exhibition of Sports, Side Cars, Motorcycles, Cycles, Accessories. Information and application forms may be obtained of James Gustavus Whiteley, Belgian Consul, 223 West Lanvale Street, Baltimore, Md.

No Cause to Fear Fuel Shortage

With decided difference of opinion as to future gasoline supply, L. B. Colby, editor of Petroleum Age, says that there is no cause to fear a fuel shortage. The Bureau of Mines, having conducted a survey of the United States, asserts that the gasoline situation is becoming serious and predicts higher prices; 35 cents per gallon in a few months, while oil men generally predict further advances before the end of 1920. But Mr. Colby

"One hundred billion barrels of crude oil, potential gasoline, are in the shale of western mountains.

"Utah and Colorado hold vast storehouses of oil, about 88,000,000 barrels.

"Wells drilled in Pennsylvania fifty years ago are still producing. One well recently drilled in an old field is yielding 1200 barrels a day.

"In November, 1919, there were 600,-000,000 gallons of gasoline above ground and manufactured. This is 250,000,000 gallons more than were accumulated at the same time one year ago.

"Besides realizing possibilities of deeper drilling, new fields, outside of the United States, have immense possibilities in Central America, South America, Mexico, Canada, Alaska and Siberia. The origin of petroleum, like the origin of electricity, is undiscovered, and it is possible that vast quantities are still being created underground."

Patriot Motors to Build \$700,000 Factory

LINCOLN, NEB., March 28.—The Patriot Motors Co., of Lincoln, has filed articles of incorporation, with capital of \$10,000,000. This is an offspring of the Hebb Motors Co., which had capital of only \$2,500,000. The new company has a gigantic expansion program, and will build three or more new buildings on their 171/2-acre site at Havelock. Passenger cars will also be produced before the end of 1920, with nearly 3000 workmen. \$8,000,000 of orders are already on hand, and double this amount is confidently predicted by the firm as the truck business for 1920 as production. Canada and Latin America will be developed as sales territory, as well as England. A superb office building is to go up, containing every modern detail for employee convenience and welfare. Passenger car production will begin late in 1920 or early in 1921, which means the erection of a \$700,000 factory. Incorporators of the new concern are A. G. Hebb, E. C. Hammond, L. A. Winship, K. Gillespie and A. H. Armstrong, who were officers and directors of the Hebb Motors Co.

Boston Clubs Sidetrack Proposed Bills

The value of organization and of the co-ordinated efforts of an association, is exemplified in the recent activities of the legislative committees of the Motor Truck Club of Massachusetts and the Boston Commercial Motor Vehicle Association, headed by Day Baker and James Scully. These bodies have been successful in bringing about the postponement of action by the legislature on a number of truck bills introduced this winter.

One of these bills proposed to limit the outside width of a truck with body to 96 in., the overall length to 28 ft. and the height to 11 ft. except when a special permit was obtained. It was proposed to limit a truck with trailers to 65 ft. overall length.

Another would require every furniture mover to file a report with the clerk of every city and town from which the furniture is moved, giving the name of the owner and place from whence and to which the goods are moved, under the penalty of a fine.

The members of the committees are grateful for the co-operation of Commissioner John M. Cole, chairman of the Public Works Department, which regulates motor trucks and constructs the State highways. He has shown a broad minded spirit by suggesting that new laws be dispensed with, as there are enough on the books at present. Mr. Cole has made an intensive study of the conditions governing motor highway transportation and it is said that he has shown a spirit of co-operation in all of his dealings with the committees of the truck associations that is commendable.

Canadian Money Received at Par

TORONTO, March 15.—The Ontario Motor Car Co., Ltd., Canadian distributors for the Packard, has been notified by the Packard Motor Car Co. that Canadian money will be received at par, and will also be invested in funds in Canada.

The Canadian distributor of the Liberty Motor Car Co., which is the Premier Motor Sales Co., of Toronto, has been given notice to the same effect.

The Stewart-Warner Speedometer Corp. has notified its Canadian distributor, Donald Johnson, of this city, who also has branches in Montreal and Winnipeg, that they will absorb 50 per cent of the exchange on specialties sold in Canada.

S. A. Miles sailed on the Mauretania March 23 bound to England, France, and Italy, to secure first-hand information regarding automobile and general foreign trade conditions for members of the N. A. C. C. He will present the request of American manufacturers for a reduction from 45 per cent to 30 per cent in American import duties on automobiles, and further co-operation in standardization and shows.

Cleveland Service Managers Meet

CLEVELAND, March 17.-An address on service by Ralph C. Rognon, president of the Automotive Service Association of New York, was the feature of the monthly meeting of the Automotive Association of this city this evening. Mr. Rognon, who founded the New York Association, described the objects of the association, how it was organized and the accomplishments to date. He also explained the need of service managers meeting and exchanging ideas and pointed out that service associations were being endorsed by the dealer associations now that the latter understood what the service men were striving for. Questions were asked by those present and answered by the speaker who gave a most interesting address on the subject of service and all its ramifications.

About 40 service managers, representing the leading truck and passenger car dealers were present, also a similar number of members of the association.

The Cleveland Automotive Association intends to form a service manager's division, which is to be affiliated with the association. Three informal meetings have been held. At a previous meeting permanent officers were elected as follows: Chairman, O. T. Hillshafer, Chandler Motor Car Co.; vice-chairman, A. O. Williams, Bissinger Co.; secretary, Dale Brown, Chamber of Commerce.

Proposed Certification of Sales and Transfers

Rep. Harreld, of Oklahoma, to prevent theft of motor vehicles, has introduced a bill to establish a Federal Motor Registration Bureau, with registrars in each state to certify all sales or transfers of motor vehicles used by highway, land, or water. Certificate of ownership must be produced from the Federal motor registrar before each sale or transfer. The proposed law includes persons, firms and corporations. The registrar is allowed \$2.00 fee, and no more. Fees in excess of \$3000 per annum, by any registrar, revert to the Treasury of the United States. No second certificate can be issued until the former one is surrendered. The usual penalties for recieving stolen property apply to those not obeying the regulation.

Antwerp Festival and Exhibitions, 1920, include three international exhibitions of motor vehicles and accessories. The first exhibition, May 15th to June 13th, includes passenger cars, tires and wheels. The second, June 26th to July 25th, shows commercial cars, agricultural tractors, camions and motors. The third exhibition, August 7th to September 15th, is devoted to motorcycles, sidecars, bicycles and their accessories. Exhibits have temporary free entry, and forms may be obtained from James Gustavus Whiteley. Belgian consul, 223 West Lanvale Street, Baltimore, Md., the appointed special representative of the Antwerp International Exhibition.

New Jersey Bill Would Increase License Fees

TRENTON, March 25.—Among the motor bills pending in the New Jersey Legislature, in the judiciary committee, is assembly bill No. 511, relating to fees for motor trucks. It was introduced by Floor Leader Hirschfield and proposes substantial increases, which are as fol-

lows:	Present	Proposed
	Fee	Fee
2,000 lb. or less	\$9.00	\$10.00
2,000 to 4,000 lb	15.00	15.00
4,001 to 6,000 lb	19.00	20.00
6,001 to 8,000 lb	23.00	30.00
8,001 to 10,000 lb	27.00	50.00
10,001 to 12,000 lb	31.00	70.00
12,001 to 14,000 lb	35.00	90.00
14,001 to 16,000 lb	39.00	110.00
16,001 to 18,000 lb	43.00	130.00
18,001 to 20,000 lb	47.00	150.00
20,001 to 22,000 lb		170.00
22,001 to 24,000 lb		190.00
24,001 lb. and over	59.00	250.00

Immediately following the introduction of the bill the Motor Truck Club of New Jersey became active and sent out a circular to its members calling attention to the proposed fees and asked them to get busy with their representatives. A hearing had been asked for and a large attendance of members was requested at the hearing at Trenton.

Previous to the hearing on this bill one was given on bill No. 508, relating to passenger cars. At this hearing T. J. Wasser, county engineer of Hudson county, asked that a commission, consisting of representatives of the automobile manufacturers, automobile club, Motor Truck Club, Commission of Motor Vehicle Department and county engineers, be appointed to investigate and make a report at the next legislature. A compromise in the bill was effected. Instead of \$1 the horsepower a 20 per cent surtax is to be added to the year 1921. The committee representing the Motor Truck Club took up the matter of having this surtax placed on Bill No. 511 and leaving the future to the commission re-This was agreeable to the ferred to. chairman of the judiciary committee and to the author of the bill, it is said.

There is also a bill pending to allow a truck to haul more than one trailer, also one to raise the annual registration fees from \$3 to \$10.

The N. A. C. C. has protested to the Interstate Commerce Commission, and asked for a hearing concerning the recommendation of five traffic officials of the U. S. Railroad Administration to the Commission recommending very heavy increases in freight rates to the Pacific coast on automobiles and trucks.

The Motor and Accessory Mfrs. Association, 33 West 42nd Street, New York, has issued a very attractive booklet, with pages full letter size, "The Triumph of Team-Work." It contains reproductions of letters from important members of the association, which speak with earnest and approving emphasis of the past accomplishments, present progress, and future promise of the association.

The New Hall Despatch

The Lewis Hall Motors Corporation, of 1956 Jefferson Avenue, West, Detroit, has just completed the first model of its 1½-ton worm-driven truck, which is known as The Hall Despatch. This high-speed vehicle will be mounted on cord pneumatic tires only, 36 x 6-in. front and 38 x 7-in. tires on the rear. In other words, this new truck is to be a high-speed vehicle powered by a Continental engine of 3¾-in. bore and 5-in. stroke. Complete details will be given in an early issue.

Just a word may be in order regarding the organization and the new factory. The home of this new corporation is just being completed at 1956 Jefferson Avenue, West, at the crossing of the Detroit connecting railroad. The building will have 55,000 square feet of manufacturing floor 1200 feet long and a 450-foot siding of space, and has a Michigan Central siding the Detroit connecting railway inside the plant. The new corporation is to handle the manufacturing of Hall trucks divorcing this business entirely from the Lewis Hall Iron Works. The principals, however, back of the enterprise are the same. The officers and directors are as follows: Officers: Harry S. Hall, president; Henry B. Lewis, vice president; W. K. Ackerman, vice president of engineering, and E. L. Southwick, secretary and treasurer. The officers are also directors in addition to the following: W. Howie Muir, F. G. Gilbert, John O'Hara and John H. Hart.

This corporation, recently formed, has \$350,000 of 8 per cent preferred stock and \$20,000 shares of no par value common. The net assets are said to be \$418,000, gross assets \$630,000 with no debts.

The new factory is said to have a capacity of from 7500 to 10,000 trucks a year, and an output of 1500 has been planned this year. J. Perkins, who is producing mamanger and superintendent, was formerly superintendent of the Packard Motor Truck Department. A. C. Field will act as purchasing agent. I. B. Meyers, western sales manager, with headquarters in San Francisco. J. Shepherd, southern sales manager.

The M. A. M. A. has launched a nationwide campaign to increase membership. M. L. Heminway, general manager, states: "The greater the membership, the greater will be the power for constructive good and the greater the results for all concerned. The association has behind it sixteen years of constructive abchievements for the good of the entire industry."

The Illinois Automobile Dealers' Association reorganized on March 22, with emphasis laid upon the need of the trade's opposing unjust and unreasonable legislation, both state and national. Affiliation is planned with the national organization, and co-operation with every organization in any effort for the good of the dealer, and the trade in general. Nearly every city of consequence in Illinois has a local association, and in the securing of this F. P. Drury, field secretary of the national organization, has had a large part.

Schwartz Truck Expands

The Schwartz Motor Truck Corporation, Reading, Pa., has secured the old Schlegel farm, 101/2 acres, within city limits, and will erect a double unit factory of 90,000 sq. ft. Each unit will be 90 x 450, width of main office 100 ft. The present Schwartz plant turns out \$50,000 monthly product, and the new factory can make \$1,000,000 worth of trucks per month. The incorporation is at \$1,500,000, with Harry B. Schwartz president and general manager, and Ralph H. Schwartz, treasurer and sales manager. John I. Hassler is chief engineer, and Louis G. Lauther is general superintendent, and has been with the Schwartz Corporation for 20 years.

Eastern Farmers Buying Trucks

Figures obtained by the United States Department of Agriculture in the investigation of the use of motor trucks by farmers indicate that eastern farmers have been adding motor trucks in their farm equipment rapidly during the last three years.

Farm Management from approximately one thousand truck owners in the New England states and New York, Pennsylvania, New Jersey, Delaware and Maryland during January and February of this year, show that at that time more than 80 per cent had owned their machines less than three years; more than four years, but less than five, 37, and more than five years, 41.

These reports were all from farmers who had purchased new trucks for their individual use. Reports on second-hand machines and on truck attachments for pleasure cars, as well as trucks used primarily for custom work or on regularly established routes were not included. While it is impossible to determine just how many of the trucks which have been in use only one or two years were purchased to replace other trucks worn out or discarded, it is known that a large percentage of the reports covers the farmers' first experience with trucks.

The N. A. D. A., realizing the value of actual representation of the dealers of the United States, a state of affairs long striven for, sees this possible in the creation of an advisory board, composed of one dealer from each state to be known officially as the board of vice-presidents. Men highly representative of the industry are to be secured. Sixteen states must still choose representatives. The expenses of these men to and from the Chicago meetings and to and from all other meetings to which they go upon the call of the directors will be borne by the national association.

The American Malleable Castings Assn. is authority for the statement that foundry capacity is ample, but that the whole trouble with the industry is due to scarcity of labor, which can be only remedied when more complete adjustment to prewar conditions come about, and largely increased immigration is felt. Not for several years will enlarged shop capacity be necessary.

Now the Newark Auto Trade Association

NEWARK, April 2.—The New Jersey Automobile Trade Association, one of the oldest in the country, will, henceforth, be known as the Newark Automobile Trade Association. This change was decided upon at the annual meeting recently in order not to conflict with the State organization which bears a name similar to that formerly employed by the local organization.

At the annual meeting of the Newark Automobile Trade Association the officers were re-elected with the exception of the treasurer. The officers are as follows: Joseph C. Bell, president; Clarence E. Fisher, vice president; Wm. L. Mallon, treasurer; John B. Strobacus, secretary, and Claude E. Holgate, executive secretary.

Garford Establishes Transportation Engineering Department

The Garford Motor Truck Co. has established at the home office, Lima, Ohio, a Transportation Engineering Department, over which is a transportation engineer of long experience with motor trucks and haulage problems. He will investigate the operation of Garford trucks in all parts of the country, and obtain data of operation costs of actual service. This includes an exhaustive review of every detail of operation, maintenance, problems of loading, routing, delivery, housing, repairing, driving. Trucks will be accompanied to procure definite records of mileage and gasoline consumption. The kind and the quantity of loads carried, distances, grades, conditions of roads, climate, frequency of stops, speeds regulation by state and town laws, in a word every fact which has any bearing upon truck operating and maintenance. Authentic information on costs that will supply exact ton-mile costs will be obtained. The department will thus be able to recommend to Garford truck users such changes or improvements in truck use as will result in the lowest possible cost per ton-mile for operation.

British Military Motor Truck Strength

According to a statement of the Secretary of State for War in the British Parliament, 6855 four-wheeled, and 1516 two-wheeled mechanical transport vehicles are to be retained by the British Army Authorities in all theatres of war during 1920-21. At present there are 16,421 four-wheelers, 6562 two-wheeled vehicles still borne on the War Department charge. The Air Force, of course, have their own trucks, distinct from these, numbering 1176 four-wheelers, and 348 motor cycles.

The Florida Automobile Dealers' Association, recently organized, has secured B. B. Hudnall as secretary. Until March first he was assistant general secretary of the National Automobile Dealers' Association.

Rhode Island to Construct Roads

About Fifty Miles of New and Reconstructed Roads Mapped Out. Snow Removal Planned for Next Winter

ESPITE the severity of the winter the improved highways of Rhode Island are reported to be in good condition by Chief Engineer Irving W. Patterson, State Board of Public Roads. Little Rhody plans to reconstruct and build about 50 miles of highways during 1920 which, when completed, will total 362.2 miles of constructed roads, 850 of state highways and a total of 2200 exclusive of the city streets.

The building program provides for the completion of trunk lines which, when finished, will afford two direct routes from Providence, the capital of the state, to Connecticut. One of these will reduce the run for trucks destined for the manufacturing centers in the Nutmeg state to 20 miles, and with the exception of a short distance in Connecticut, a gap of a few miles, will connect with a main thoroughfare. This gap is to be bridged by a new road.

Shore Road to be Rebuilt

The largest amount of highway construction will be in Washington county where two sections of five and six miles are to be constructed. These are on what is termed the shore road which is called upon to sustain very heavy truck and passenger car traffic. Trucks from New York, New Haven and Bridgeport use this road to Providence and vice versa, and for the past year or two the road conditions between Charlestown and Perryville, and Charlestown and Westerly, have not been of the best. The new road, when completed, will afford excellent opportunities for shipping by truck, as most of the construction is to be of concrete and bituminous concrete. stretch between Westerly and Charlestown, particularly the road leading from the former place to a point about six miles distant, will eliminate many of the bad curves which existed. Option will be given the truck driver of two highways from Wickford to Wakefield. One over what is known as the Tower Hill road and the other over Barber's Heights or the Pier Shore road. The work is completed on the last named with the exception of a very short stretch just outside of Saunderstown, to which place trucks cross on the ferry from Newport and from Fall River, Mass.

Direct Routes to Connecticut Line

One of the direct routes from Providence into Connecticut will be through Cranston, Scituate and Foster when the seven-mile stretch from Rice City to Richmond is completed. Part of the new road will be around the reservoir where the state's supply of water will be obtained. Two strips, totaling about three miles, will afford another route into Connecticut at the northwestern part of the

All of the new roads to be constructed will be of the maximum width permitted by the state, of 14 feet. In a number of places the roads are less than this width. The new roads will be concrete and 6½ miles of reconstruction will be of the same material. There will be 18 miles of bituminous concrete and 14 of bituminous macadam.

Start Snow Removal Campaign

Due to the efforts of the State Board of Public Roads a bill was passed appropriating \$50,000 for snow removal. Unfortunately the appropriation was made too late for the highway department to put its plans in practice, although 37 snow plows were purchased. These are designed to be attached to the state's trucks. The balance of the sum appropriated will not, it is said, be available for next winter, as it was voted for use during the winter of 1919-1920.

Effort is being made to have the Legis-

lature appropriate funds for next winter, and at the time this article was prepared it was said that although considerable opposition had developed to the plan among the country legislators, it was hoped that their objections could be overcome. In Rhode Island the separate cities and towns are responsible for relieving the conditions brought about by accumulations of ice and snow upon the state roads in their respective boundaries. While the law is very definite in fixing the responsibility for the meeting of snow conditions upon the state highways, it has not been carried out effectively in past years.

Advocates Roads for Trucks

Chief Engineer Patterson believes that the responsibility is up to the state, that the expense should be borne by it and that special attention should be paid to the roads carrying the heaviest travel. He stated that motor highway transportation is but in its infancy, that roads must be constructed to care for trucks and that they must be kept open during the winter. Effort will be made to enact a bill to accomplish this work before the present Legislature adjourns.



Illinois Motor Truck Dealers Take Prominent Part in New State Association

Peoria Motor Truck Dealer is Chosen President. Organization Starts Off With Pledged Membership of Over Seven Hundred

By A. V. COMINGS

OTOR truck dealers of Illinois played a conspicuous part in the organization meeting of the Illinois Automotive Trade Association, held in the state capitol at Springfield March 22d and 23d. The meeting was one of the most encouraging gatherings of this type ever staged, and the new association starts off with a pledged membership of over 700, in which will be found the leaders in all departments of the automotive business, in the greater cities as well as in the rural communities. The spirit of fairness, co-operation, of a ready willingness to work hard in solving the problems confronting the industry, were very much in evidence.

H. B. Pinkerton, of Peoria, Dodge passenger car and Federal motor truck dealer, was elected president unanimously. Mr. Pinkerton is also state vice president for Illinois of the N. A. D. A. The other officers elected were as follows:

First vice president, L. A. Piel, of Chicago, who is also president of the Chicago Automobile Trade Association; second vice president, Morris Adler, Quincy; third vice president, Ray Sparks, Champaign, fourth vice president, Frank Jennings, Springfield; treasurer, Tom Hay, Chicago.

The board of directors, which represents every phase of the industry, is composed of the following: R. C. Cook, W. H. Taylor, Ward Perry, H. E. Halbert, all of Chicago; B. B. Burns, Decatur; Paul Kileen, Galesburg; H. F. Horseman, Alton; Ed Spiegel, Kewanee; W. H. Williamson, Rockford; R. C. Schell, Beardstown; J. Murray, Bloomington, and Harry Snyder, Danville.

The organization meeting was called by the National Automobile Dealers' As-.

sociation, after months of preparatory work by Manager Harry G. Mooch and his assistant, P. F. Drury. Through their efforts many new local associations were organized in Illinois during the past few months, and these local organizations and leaders in the trade in other cities were represented strongly at the Springfield meeting.

For the first time in the history of the industry a state association meeting was held in the state capitol. The sessions at Springfield were held in the senate chamber, a signal honor to the wonderful industry represented, and the meetings were conducted with a dignity and a high sense of duty to be performed that did credit to the best traditions of the august chamber.

The array of speakers who appeared on the two days' program was without



Governor Frank O. Lowden
Who told the delegates that the country must
look to 'the motor truck to solve the many
transportation problems of the future.

P. F. Drury

Assistant manager of the N. A.
D. A., to whose energy much of the success of the Illinois meeting was due.

Who is the Federal truck distributor for the Chicago territory, conducted the motor truck forum.



L. A. Piel
President of the Chicago Automobile Trade Association, who
was chosen vice-president of the
state association.

doubt the best ever gathered for such an event. Those who addressed the convention were Governor Frank O. Lowden, of Illinois; Judge Harry Atwood, of Chicago; H. B. Harper, president of the N. A. D. A.; Harry G. Moock, manager of that association; L. A. Piel, president Chicago Automobile Trade Association; George Fritz, national field secretary Automotive Equipment Association; Charles Hendy, manager Ford Motor Car Co., Chicago; Pyke Johnson, N. A. C. C. and N. A. D. A. representative at Washington; Edward S. Jordan, president Jordan Motor Car Co., Chicago; A. R. Kroh, farm motorization expert, Chicago, and Captain Robert E. Lee, manager St. Louis Automobile Manufacturers and Dealers' Association.

Governor Lauds the Motor Truck

Among the most significant statements made by the speakers was the following by Governor Lowden, who is one of the leading contestants for the Republican presidential nomination. Governor Lowden said:

"I am particularly glad you have organized, for you will be a powerful aid to those public officials who are trying to meet the problems of this day. No one of us can even get a hint of the importance that this industry is going to bear in the whole subject of transportation within a very few years. Everyone knows that the railroads have reached the limit of their capacity. They are no longer equal to the demands of commerce. Even with all the expansion that the most optimistic promise for the railroads it is impossible for them to keep up with the increased commerce of this country, and so the good roads with the motor

trucks are the real hope of the future in the solution of the transportation questions, I believe."

Governor Lowden also endorsed without reservation the unreserved cooperation of the federal, state and county governments on the roadbuilding program of the nation, that the Federal Government should have full charge of the construction of national highways, the state of certain highways and the county officials of their roads of local importance.

Nicol Discusses Truck Sales Problems

During the sessions forum discussions were held by various divisions of the trade, the motor truck forum being conducted by John Nicol, Federal truck distributor in the Chicago territory. In introducing the discussion, Mr. Nicol spoke as follows on truck sales problems confronting the trade today:

"There is no doubt that motor trucks can be sold successfully at an honest price. Merchandizing of hauling units is passing through the same stage the passenger cars went through years ago, that of fictitious values and discounts that tend to fool the buyer.

"Practices that are detrimental to good business have been indulged in more in Chicago than in most cities, but many of the concerns that have used these loose methods have gone out of business, and those that are still practicing them are not making the clean profits to which they are entitled.

'It begins to look as though the motor truck business will become stabilized in this section of the country. The successful merchandizing method of motor trucks must be one of honest value and of satisfactory service. There are dealers that have built up their business on the principle of full value for the money without giving discounts and experience proves that this is sound business practice. purchaser of a motor truck or of any other piece of merchandize is willing to pay the price that is universally received for the product. It is not so much his desire to buy cheaper than his neighbor, but to know that he can buy at the same price. If this policy was universally followed the motor truck business would be on a sound basis.

"On account of the scarcity of trucks at this particular time it seems almost criminal for dealers to quote discounts when it should be a very easy matter to get a full list price, especially as we are unable to deliver promptly some of the trucks we have sold.

Deferred Payments

"It was not many months ago that the purchaser of a motor truck could make a



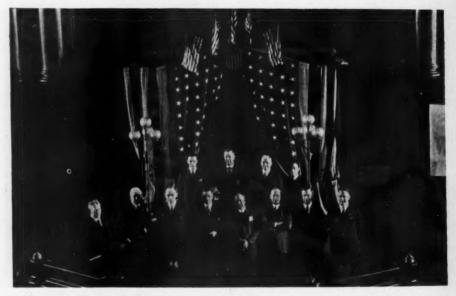
H. B. Pinkerton

Dodge and Federal dealer at Peoria; also president Illinois Automotive Trade Association

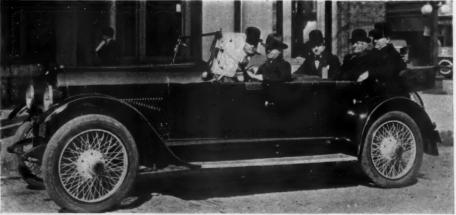
very small cash payment, and have time payments extend over a period of 18 to 24 months. However, these long-time payments have proved to be rather disastrous to the dealer. If a minimum cash payment of 25 per cent is received from the purchaser, and deferred payments limited to 12 months, the dealers will find that there will be very few trucks that will be repossessed. On the other hand, when less than 25 per cent is paid down and payments extend over 15 months the purchaser is in reality securing a new truck for less than he could rent one for, and it is a temptation on the part of the purchaser to turn the truck back to the dealer after his busy season is over. This would not be the case, however, if the purchaser pays at least 25 per cent down payment, and deferred payments fall due within a year.

Allowances for Used Trucks

"There are dealers who maintain their list prices, but go absolutely wild on trade-in valves. It is safe to say that when motor trucks are traded in at least 75 per cent of them are ready for the junk dealer. It is not uncommon for a purchaser to have truck dealers bidding against each other at a high price for a truck that is practically junk. If dealers



Officers and Directors of the Illinois Automotive Trade Association Grouped on the Speaker's Stand, Senate Chamber, Capitol Building, Springfield, Illinois



A Car-Load of Officials

Left to right: George H. Bird, former president Chicago Automobile Trade Association and Paige truck dealer, Chicago; C. W. Nickey, Paige truck dealer, Springfield; Harry G. Moock, manager N. A. D. A.; L. A. Piel, president Chicago Automobile Trade Association and vice-president of the state association; Bruce Pinkerton, of Peoria, president of the state association.

would offer the amount of money that the truck could be sold for, less the cost of putting same in repair, less overhead and sales expense, it would not be such a temptation to offer a man a fancy price for a vehicle that is of little value.

Oversize Selling

"In the anxiety to make a large commission many truck concerns have sold a 3½-ton truck to a customer when, as a matter of fact, a 1½ or a 2-ton truck would have been amply large, with the result that the customer believes that motor trucking does not pay in his business on account of the excessive costs.

"Bodies should be provided that will hold the rated capacity of the truck, rather than 100 per cent overload. The customer that is intelligently and carefully sold, his hauling problems analyzed, should shortly be in the market for his second truck. If he is oversold he is liable to become discontented and either contract his hauling or go back to horses."

The motor truck forum was well attended and the subjects outlined by Mr. Nicol were thoroughly discussed.

During the sessions of the convention, several very "peppy" sales talks were given by delegates, one of the most important being a keen analysis of some of the evils of truck merchandising by W.

C. Reinhold, general manager of the Vim Sales & Service Co., of Chicago. Mr. Reinhold particularly emphasized the necessity of better education in salesmanship of the men who go out into the business community to sell motor trucks.

In the matter of dues for the new state organization, it was decided that an annual fee of \$15 each be required from members up to the limit of fifty in each local association, with dues of \$7.50 for

all above that number in the local association. For Chicago the first 100 pay \$15, with \$7.50 for all over that figure. Chicago has a trade membership of 270 which automatically becomes members of the association. A special arrangement was made that all small dealers, garage men, etc., whose stock does not total \$1000 investment, be admitted at the \$7.50 rate.

Many Important Subjects Discussed at Sales Managers' Convention

EMBERS of the National Association of the Motor Truck Sales Managers met in regular session at the Congress Hotel in Chicago March 26th and 27th, and participated in a program that proved one of the best thus far offered since the inception of the association. The subjects covered a wide range of the industry's problems and were ably handled by the speakers to whom they were assigned. The subjects and the speakers were as follows:

"The District Sales Manager, His Duties and His Compensation," by F. L. Pierce, general sales manager Federal Motor Truck Co.

"The Truck Show," by C. S. Pike, vice president and manager of sales, Paige-Detroit Motor Car Co.

"New Thoughts in Merchandising Methods of Motor Trucks," by R. E. Chamberlain, manager freight transportation, Packard Motor Car Co.

"Increased Retail Selling Efficiency as a Means of Maintaining List Prices," by E. A. Hart, manager sales promotion, Willys-Overland Co.

"The Evil of Price Cutting—Remedies," by H. J. Vogler, general sales manager, American Motor Truck Co.

"How to Make a Success of Local Dealers' Organizations," by E. E. Peake, manager Kansas City Motor Car Dealers' Association.

"The Retail Truck Dealers' Cost of Doing Business," by Robert O. Patten, manager truck sales, Pierce-Arrow Co.

manager truck sales, Pierce-Arrow Co.
"The Future of the Motor Bus," by R.
H. Baldwin, of Goodyear Tire and Rubber Co.

Most of the subjects were discussed behind closed doors, but the Saturday morning program, to which the public was admitted, proved of a very interesting nature.

Discuss the Motor Truck Shows

Much discussion was aroused on the subject of next year's motor truck shows, and it was the concensus of opinion that the manufacturers wanted no more truck shows during the same week as passenger car shows, in the larger cities, nor did they want them conducted as they have been in the past, as to certain details. A committee was appointed to take this matter in hand and when show times rolls around next year some very different arrangements may be confidently looked for

The association refused to endorse offically the Omaha World-Herald truck tour scheduled for June.

One of the most pertinent papers of the meeting was read by Robert O. Patten, of the Pierce-Arrow Company, relating to the retail truck dealers' business methods. Mr. Patten holds that the success of the motor truck dealer lies not entirely within his own hands, but that it is, in a measure, up to the manufacturer. He acknowledges that there is a considerable dealer unrest at the present time and that a method must be found to bring about a closer working bond between the manufacturer and the dealer who represents him.

Should be Careful in Selection of Dealer

One thing the manufacturer should insist upon, thinks Mr. Patten, and that is that the dealer should at all times sell his trucks at a price that will allow him his full commission, so that he may make money in the business. It is up to the manufacturer to secure dealers who have some business ability and financial standing, not to contract with the first man that comes along and wants to handle the truck.

The answer to the diminishing profits of the dealer lies not in increased discounts, according to Mr. Patten, as that would mean a greater price to the consumer, resulting in a decrease in volume of business done by the retailer and consequent mounting costs of doing business.

Mr. Patten thinks every motor truck manufacturer should map out for the absolute guidance of its dealers a real, iron-clad policy as to marketing, financing and serviceing motor trucks, to the end that each dealer should follow methods that have proved successful. Dealers are drifting, insofar as fundamentals are concerned, said Mr. Patten, and it is partly the fault of the manufacturer.

Favors Commission or Bonus for Salesmen

Mr. Patten thinks the salesman should be on the same basis as the dealer, as to compensation. The dealer invests his money and his time in the business, and the more trucks he sells the more money he makes. The salesman should be on a basis so that the more trucks he sells, the more he should make, this to be arranged either by commission or bonus. The dealer should not have to stand the expense of "trying out" new men day

after day who never become profitable salesmen.

The dealer must be more and more a man of bigger business ability. He must know how to finance his business, must economize, must become more efficient and must increase his business volume. He should know how to plan his men's shop work so that there will be a steady run of work through the shop, not a rush and a lull.

The manufacturer should devise a uniform accounting method to be used by all his dealers, with an audit to be sent into the home office quarterly, so that comparisons could be made that would work out to the benefit of all the dealers. By this means the mistakes of some dealers could readily be detected, and benefited by the better methods of the others. By present systems, there is practically no basis of comparisons, as every dealer, even under the same manufacturer, uses an independent accounting system.

Manufacturers Should Train Dealers

In concluding Mr. Patten said he thought there was a huge obligation resting on the manufacturers to train the dealers better, that they must be made to show more initiative and progress, must build better reputations as their factory above them builds better reputation.

"The factory versus the dealer will never accomplish anything," said Mr. Patten. "The factory plus the dealer can accomplish anything."

See Big Future in Bus Business

R. H. Baldwin, of the Goodyear organization, gave some very interesting figures on the growth of motor bus transportation to the sales managers, and pointed out to them that the motor bus will become one of the greatest sales outlets of the manufacturers within a very short time. He cited the increase in the number of lines, the different attitude taken by the public toward them, and the growing popularity of what he termed "everybody's automobile." More and More and more are traction interests, hitherto tied to rail transportation, inquiring into bus transportation as an investment for their money, and this in itself presages a wonderful expansion of this phase of passenger carrying in the near future. Mr. Baldwin's talk set the sales managers to thinking, and it is very probable they will give more attention to this subject in the future than they have in the past.

At the open session brief talks were made by L. A. Piel, president of the Chicago Automobile Trade Association and Selden dealer in Chicago, and John Nicol, Federal truck dealer in Chicago, relative to cut-price motor truck selling. This has been a particular evil in the Windy City, and strenuous efforts have been made to bring about a reform in present methods with some success.

At the luncheon meeting of the association, to which the public was invited, E. E. Peake, manager of the Kansas City Motor Car Dealers' Association, gave the sales managers his ideas as to how to make a success of a local dealers' organization. Mr. Peake said there are just three things necessary—Plenty, Push and Psychology.

The plenty referred to money; an association must be properly financed, like any successful business, if it is to function properly.

The push must come from the members, every one doing his part and not merely paying his dues and sitting back waiting for the other fellows to do the work.

The psychology must be a trait thor-

oughly understood by the business manager, who must be able to pick out the proper type of men from the membership to do the things that must be done to make the organization accomplish the things that are put up to it. The manager must be a high-priced man, not a cheap one.

Associations are an absolute necessity, thinks Mr. Peake, yet they are not worth a penny if they don't take up with a firm hand the insane business methods indulged in by some dealers, and curb them. Associations can do things only from the power generated among their members, and all branches of the trade should be in the same central organization, not in separate units.

Mr. Peake has been one of the most successful trade association managers in the country, and the points outlined by him to the sales managers will be of real value to them in helping their dealers in organization work throughout the country.

A. R. Kroh, farm motorization expert, was another speaker on the luncheon program, and, just fresh from a whirlwind speaking tour in California, Illinois

and Texas, he was able to tell the salesmanagers many new and vital things that he had not touched upon in previous talks to them.

Dr. Clarence J. Owens, president of the Southern Commercial Congress, gave a particularly happy address at the luncheon session. Dr. Owens is author of the Federal farm loan act, the bill promoting the use of the motor truck in parcel post work in the country, and the bill distributing the army motor trucks through the country for highway work, thus taking them out of the active market. His address was a greeting from the southland, with much interesting and informative data relative to the future of the motor truck as regards the rural districts of the country.

At the banquet of the association, held in the evening of the first day's session, Julean Arnold and Judge Roland Baggott were the principal speakers.

At the business session J. F. Bowman, of the Garford Motor Truck Co., was elected a director to fill the vacancy caused by the retirement from the association of Harry Conlon, formerly of the Acason Motor Truck Co.

New Jersey to Hold Truck Tour

EWARK, April 3.—New Jersey will observe the Ship-By-Truck week, May 17-22, by a tour in the northern part of the State. At a meeting of the Newark Automobile Trade Association the organization decided to sponsor the tour and executive secretary, Claude E. Holgate, was appointed manager.

The present plans call for leaving Newark early on the morning of May 17 and touring through about 200 towns and cities and traveling a distance of about 500 miles in the six days. A tentative route has been selected which provides for the night stops at Asbury Park, Summerville, Hackettstown, Sussex and Paterson. This route may be modified as one leg is said to be quite long and through a section where much of the effort would be wasted. It is the intention of the committee in charge to make a careful investigation of the territory in order that the greatest amount of good may be obtained.

Large Entry List Assured

There is every indication that the tour will be a big success. With over 50 truck dealers in Newark it is believed that from 30 to 40 will be represented, and that some will enter more than one truck. At the present time 19 have entered and sent their entrance fee. Entries will be received up to within a week of the start of the tour. Manager Holgate, who has had considerable experience with truck tours, says that there will be at least 40 trucks entered and that the tour will go over big.

A band will accompany the trucks and manager Holgate is arranging to have corps of capable speakers. These will include men who are entirely familiar with the territory, which includes many rich farming sections and one or more of

the countries are within easy trucking distance of Newark. Practical demonstrations, the carrying of loads free, will do much towards convincing the farmer of the utility and economy of the motor truck. A slight modification of the usual truck tour education methods will be employed as the same policies so successful in the Middle West and West will not apply in the East.

A Strictly Dealer Event

The truck tour will be a strictly dealer event and will accomplish much to aid the sub-agent and dealer in the undeveloped territory. In addition to an extensive publicity campaign through the local newspapers, billing the towns, etc., the small dealers will be supplied with ample literature and instructions how to secure the presence of all those who might be interested in trucks. Effort is also to be directed in aiding the small dealer work up a prospect list in his territory, and to supply him with sales helps.

The entry list up to the present time of writing, and five weeks before the entry list closes, includes the following dealers and makes of trucks: W. J. B. Motor Truck Company, 2 Republics; Standard Auto Sales Company, Standard; Packard Motor Car Company of N. Y., Packard; National Motor Truck Company, Ward La France; Macy Motor Truck Company, Gramm-Bernstein; Scull & Malone Sales Company, Kelly-Springfield; Hoagland-Thayer, Inc., GMC; Whiting Motor Company, International; Lazal Motor Corp., 2 Service; Arthur Rehberger & Son, Maccar; Reo Motor Car Company, Reo; Rice-Macrae Motor Truck Company, Day-Elder; F. B. Hague Company, Stewart; Vreeland Motor Company, 2 Ultimate; Sterling Motor Car Company, Sterling;

Goodyear Tire & Rubber Company, Packard. A number of others have signified their intentions of taking part.

Major Fred Mason, Lazal Motor Corp., will be tourmaster. The committee of arrangements includes D. E. Lane, Packard Motor Car Company of N. Y.; R. F. Allen, Lazal Motor Corp.; K. H. Dresser, Goodyear Tire & Rubber Company, and F. P. Hall, Firestone Tire & Rubber Company. The publicity is in charge of Robert F. Woodwill, Ludlum Motor Sales Company, and the statistics will be compiled by W. J. Brister.

Motor Truck Club to Co-operate

The Motor Truck Club of New Jersey is to co-operate by holding a truck and passenger car parade on Saturday, May 22, the final day of the truck tour. It is planned to meet the returning trucks on the outskirts of Newark and escort them through the city. Prizes will be awarded the cars and trucks. The parade is in charge of Alfred Way, Jr., executive secretary of the New Jersey Motor Truck Club. The committee comprises H. F. Bacon, E. F. Bock, George Bruno, Wm. Bittles, Jr., George Ludlum, John Conover, Kenneth Apolant, George Suebold and O. Shalk.

Bill in Congress for a Truck Highways System

Congressman Raker has introduced a House bill in order to align motor truck highways with a general national highway system authorized by a previous bill already offered by Raker. The first bill aims to create a national department of highways to be known as such, for the construction and maintenance of a system government expense, although the work of construction and maintenance is to be done by state highway authorities. The bill carries an appropriation of \$10,000,000.

Transportation Committee of the Federal Highways Council Holds First Meeting

WASHINGTON, D. C., April 5 .- The first meeting of the newly organized transportation committee of the Federal Highway Council was held today with a representative gathering of men from all branches of the industry. Practically all of the subjects outlined in the accompanying program were discussed at great The meeting was presided over by S. M. Williams, chairman of the Federal Highway Council, assisted by C. W. Reed, transportation manager of the council. The policy of this committee and the program which this committee is now

"To assist in co-ordinating Policy: highway transportation with the other transportation agencies of the country; to encourage the development of highways that will advance the economic life of the nation; stimulate their use in such a manner as to facilitate and cheapen the transportation of food, raw materials and finished products, and co-operate with government agencies, both state and national, to the end that our highways may be of maximum service in the transportation system of the country."

Purpose: To recognize the problems of the road builder.

To realize the needs of the road user. To visualize future highway transportation requirements.

To co-operate with the railroads and waterways to the end that the public may enjoy that form of transportation which is most efficient, economical and prac-

To study the problems attending the entrance of the motor truck into our daily life in order that we may assist the industry, which is industrially great and financially strong, in its effort to be economically right.

To encourage the establishment of motor express lines.

To promote uniform legislation.

To gather such information and statistics as will be a guidance to those interested in determining the economic field for highway transport, and act as a clearing house for the dissemination of the

Study of highway transport functions of state highway departments, including snow removal and traffic surveys by state highway departments.

Legislation affecting highway transportation, state and national.

- (a) Type of state supervision now effecting highway transporta-
- Type of supervision preferable, if any, for best interest of trans-

Policy of Council toward other forms of transportation.

Short haul and terminal problems:

- (a) Branch lines and new territory.
- (b) Transportation surveys.
- (c) The motor truck in terminal work.
- (d) Store door delivery.
- (e) Use of trailers in reducing cost per ton mile.

Rural motor express:

- (a) Franchises.
- (b) Insurance.
- (c) Uniform receipts and bills of lading.
- (d) Marketing.

Return loads, present status and development of machinery for putting it into practical operation.

Motor truck statistics, including costs, rates, etc.

Educational work in universities and schools.

To Appoint Sub-Committees

Chairman Williams is now appointing sub-committees which will be made up from the personnel of the main committee. These sub-committees will be assigned different subjects as outlined in the pro-

Members of the Transportation Committee

S. V. Norton, Chairman, B. F. Goodrich Rubber Company, Akron, Ohio. George M. Pride, Heavy Haulage Company, New York City. T. R. Dahl, Vice-President, The White Company, Cleveland, Ohio.

*C. A. Musselman, Treas. The Chilton Company, Philadelphia, Pa. *D. C. Fenner, International Motor Company, New York City.

*David Beecroft, Automotive Industries, New York City.

A. N. Cummer, Autocar Company, Ardmore, Pa. *R. E. Chamberlain, Truck Sales Mgr., Packard Motor Car Com-pany, Detroit, Mich. Mr. Chamberlain was represented by R. E. Macduff.

*Tom Snyder, Chamber of Commerce, Indianapolis, Ind. F. J. Wells,

Pierce-Arrow Motor Car Company, Buffalo, N. Y.

R. S. Wilson, Goodyear Tire & Rubber Company Akron, Ohio.

*J. F. Bowman, General Sales Mgr., Garford Motor Car Company, Lima, Ohio. *Indicates those who attended first meeting.

Professor A. H. Blanchard, University of Michigan, Ann Arbor, Mich. Chicago, Ill.

F. W. Fenn, Sec'y, Motor Truck Committee, N.A.C.C., New York City. W. Cowling, Ford Motor Car Company, Detroit, Mich. E. T. Herbig, Service Motor Truck Company, Wabash, Ind. J. C. Marquis, The Country Gentleman, Curtis Publishing Company. T. D. Pratt, Secondarion
T. D. Pratt, Secondarion
Ca., New York City.
Ernest F. Farr, Chief,
Ship by Truck Bureau,
Firestone Motor Truck Company,
Akron, Ohio.
T. C. Rowley,
Truck Company, D. Pratt, Secretary, otor Truck Association of Ameri-, New York City. Akron, Onio,
W. C. Rowley,
Federal Motor Truck Company,
Detroit, Mich.
*Joseph Husson, Editor,
Commercial Vehicle,
New York City. C. F. Touse, Asst. Sales Mgr., General Motors Company, Pontiac, Mich. F. E. Ertsman, Secretary, Motor Truck Owners' Association, Chicago, Ill. S. E. Norton, c/o Norton Buick Auto Company, Denver, Colo. J. H. Collins, Commercial Survey Dept., Chilton Company, Philadelphia, Pa. A. J. Whippel, Diamond "T" Motor Truck Co.,

Walter Wardrop, President, The Power Wagon, Chicago, Ill. John T. Stockton, c/o Stockton Transfer Company, Chicago, Ill. H. W. Perry, Manager,
Trailer Manufacturers' Association,
New York City.

A. R. Kroh, The Goodyear Tire & Rubber Co., Akron, Ohio. R. E. Hines, Hines Motor Car Company, Jackson, Miss.

*Raymond Beck, Chief, Goodrich Travel and Transport Bureau, The B. F. Goodrich Rubber Company, Akron, Ohio. James L. Geddes, President, Kelly-Springfield Co., Springfield, Ohio.

*Pyke Johnson, Sec'y, Highways Committee, N. A. C. C., Washington, D. C.

A. F. Williams, Vice-President, Winther Motor Truck Company, Washington, D. C.

*C. M. Wood, Good Roads Bureau, Goodyear Tire & Rubber Company, Akron, Ohio.

*F. Van Z, Lane, 245 West 55th Street, New York City.

C. T. Bradford, Manager, Traffic Department, International Harvester Company, Chicago, Ill.

J. E. Pickens, Selden Truck Corporation, Rochester, N. Y. V. D. L. Robinson, Secretary, Dixie Highway Association, Chattanooga, Tenn. L. E. Warford, B. F. Goodrich Rubber Company, Seattle, Wash. H. L. Dewey, Republic Motor Truck Company, Alma, Mich.

*Lee Lamar Robinson, Council of National Defense, Washington, D. C.

*Dr. R. S. MacElwee, Asst. Director, Bureau of Foreign and Domestic Commerce, Department of Com-merce, 19th and Pa. Ave., Washington, D. C.

*D. B. Owen, Chairman, Transportation Committee, National Association of M Officials, Richmond, Virginia. Market

*E. E. Parsonage, Director, John Deere Wagon Company, John Deere Moline, Ill.

John Lionberger, c/o Lionberger Tire & Service Co. Omaha, Nebraska,

*W. J. L. Banham, General Traffic Mgr., Otis Elevator Company, New York City.

B. F. Fitch, President, Motor Terminals Company, Cleveland, Ohio.

Farmers Favor Co-operative Ownership

Farmers are adopting the co-operative ownership plan, which is reported as spreading rapidly into the rural motor express field, particularly in those states in which the farmers have been schooled in the principles of co-operation through

such associations directing creameries, grain elevators and marketing agencies.

The N. A. C. C. has asked the executive committee of the American Railroad Association to provide door openings wider than six feet in new standard box cars that individual railroad lines may build in the future. Automobile traffic reached 300,000 carloads in 1919, and carriers lost fully 40,000 carloads of machines that were driven long distances because automobile freight cars were not available. Some 80,000 so-called automobile cars are now available; that is, box cars having extra wide side doors, and in some cases end doors.

NEW COMMERCIAL CARS











New Two and a Half Ton Karavan Truck is a Portland Product

NEW entrant in the motor truck field is a new 2½-ton job known as the model-A Karavan truck, which is being produced by the newly organized Karavan Motors Company, Portland, Oregon. This company, which was recently organized with a capital of \$100,000, consists of the following officers: E. D. Van Dersal, president; Fred Hesse, vice president and consulting engineer, who is also manager of the Hesse Iron Works, Portland; Whitney L. Boise, secretary, and George H. Peters, engineer in charge of construction.

This worm-drive truck is not only equipped with well-known standard truck units, but also includes in its equipment many of the effective parts of recognized practice, such as the Orem Dusteter, Duplex governor, Alemite system of lubrication, Dreadnaught odometer, etc. Another feature is the hardwood sills which extend from the rear of the fromt spring hangers to the rear of the frame, which permits of the mounting of the gas tank, driver's seat and body on a wood foundation, which is declared to insure longer life by reducing vibration.

The Karavan Company also consider specific tonnage ratings as obsolete, stating that the approved modern sliding methods call more for a closer application of the exact specifications, gear ratio, tires, wheel base and other integral parts, with the result that a greater econ-

omy and operation is therefore obtained.

Although licensed at 5000 lb. and 6000 lb., if equipped with pneumatics, the tonnage variation of the Karavan truck is in keeping with the commodity to be carried, road conditions, gear reduction to be employed and tire specifications. The chassis weight is 5700 lbs. and permits of a body allowance of 1300 lbs. Either of two wheel bases may be obtained, one of which is 148 in. and the other 168 in.

power The plant consists of a Buda Engine with a bore and stroke of 41/4 x 6 in., respectively. It is of the four-cylinder L-head type, cast in block with removable head. The force-feed of lubrication is employed through drilled holes in the crank-shaft to the main bearings. Oil pressure can be ascertained at any time from a pressure gauge on the dash. Ignition is provided by a Berling high-tension magneto with an automatic impulse starter. This magneto is water, dust and oil proof. A Zenith model L-5 plain tube type carburetor having hot-air connections, and an Orem Dusteter air cleaner, is used. The function of the Orem device is to prevent dust and grit from entering the crank-case, thereby increasing the life of the bearing, piston rings and cylinder walls, as the passage of foreign substances to these parts is prevented.



Front View of the New 2½-Ton, Model A, Karayan Truck

Close-up Under the

Showing carburetor side of the Buda engine. Not the assembly of the Orem Dusteter from dash to carburetor.



Illustrating the Clean Cut Lines and Sturdy Construction of This New Pneumatic-Equipped Job

The power is transmitted from the engine through a Brown-Lipe clutch, which consists of 12 Raybestos lined plates, to a Brown-Lipe, selective-type, transmission suspended amidships on three points. This gearset provides four speeds forward and one reverse. The speed is 15 m.p.h. on solid tires and 18 m.p.h. on pneumatics and is controlled by a Duplex governor, which is driven by the motor when in high gear and by the transmission when other speeds are employed. Power for the air pump is also received for the transmission, which is transmitted from a power take-off. Timken bearings and

extra wide faced gears are used in the transmission. Power is transmitted from gear-set through a tubular drive shaft, provided with Spicer universal joints, to a Sheldon worm-drive rear axle.

Steering is through a Ross, worm with solid nut, steering gear, and is encased in an oil-tight housing. This gear has but one adjustment and is mounted on the left side. Throttle and spark levers are provided on the top of the steering wheel, in addition to a hand throttle and foot accelerator pedal. Speed controls are located at the center.

The frame is of 6-in, hot rolled channel

section. The Sheldon semi-elliptic springs are of chromium silica manganese and are 42 in. long, $2\frac{1}{2}$ in. wide in the front and 56 in. long, 3 in. mide in the rear. The spring eyes are of phosphor bronze bushed. Internal expanding brakes are used, expanding on an 18-in. drum. Solid or pneumatic tires may be used on steel wheels of Smith make.

The standard equipment consists of a tool box with complete set of tools, oil can, horn, jack, hub cap, valve and magneto wrenches. Dreadnaught Odometer, Alemite grease gun, two kerosene side lamps and kerosene tail lamp.

Two New Special MacDonald Trucks for Special Service

HE introduction of two new special models of trucks built for distinct and special purposes, marks the inception of the MacDonald trucks, manufactured by the MacDonald Truck & Tractor Co., of San Francisco, Cal., a new entrant in the field of motor transports. Each of these two new models have a distinct purpose. The short-haul type is

ing of the various speeds. The load capacity can be varied to suit conditions of lower speeds with heavier loads and on difficult roads or, on the other hand greater speed where road conditions permit.

The following are specifications of the low-bodied short-haul type MacDonald truck:



Showing the Vast Loading Possibilities of the New MacDonald Truck
The load consists of 220 sacks of flour weighing 11 tons

particularly adaptable for the economical transportation of commodities for short hauls, and the freighter type was designed with an eye on the need of a satisfactory hauling unit for long distances. A feature of the short-haul type is the extremely low platform which is 16½ in. above the level of the ground, facilitating easy loading and unloading. Complete control and easy steering regardless of the weight of the load, can be accomplished through the hydraulic steering gear, a development of this company and an exclusive feature of the MacDonald truck.

The freighter model was designed and constructed to satisfactorily meet all road conditions. Incorporated in this model is a short wheelbase, narrow tread, low frame suspension, a transmission which provides 4 speeds with a gear ratio permitting effective city, mountain and highway service and four wheel brakes. Flexible load capacity is possible by the shift-

Motor: Buda 4½ x 6 bore and stroke, Model Y. T. U.

Transmission: Brown & Lipe, four speeds forward and reverse.

Differential: Special heavy duty type.

Carburetor: Stromberg M-2. Governor: Simplex.

Radiator: Special with Spirex core; 81/2 gal. capacity.

Clutch: Brown & Lipe multiple dry disk. Final Drive: Internal gear on front

Steering Gear: MacDonald hydraulic system.

Truck Body: Height above street level 161/2 in.

Width between side panels 60 in.

Length 14 ft. 6 in. with tailboard 20 ft. 6 in.

Clearance under body 9 in. Width over rear hub caps 8 ft. 51/4 in. Rear Axle Crank: 5 x 5 in. Rear Axle Spindle: 41/4 in. diam.

Rear Tires: 40 x 7 in. dual or 40 x 4 in. Giants at an additional charge.

Wheelbase: 188 in.

Overall Length: 22 ft. 11 in.

Load limited only by capacity of tires and payement.

Specifications of the Freighter Type

Motor: Buda 5 in. x 6½ bore and stroke; Model B T U.

Transmission: Brown & Lipe four speed. Clutch: Brown & Lipe multiple dry disk. Final Drive: Through three gear ratios to

internal gear rear axle.

Differential: Special heavy duty.

Carburetor: Stromberg M3.

Governor: Simplex.

Radiator: Special with Spirex core; 81/2 gal. capacity.

Steering Gear: MacDonald hydraulic sys-

Brakes: On all four wheels.

Truck Body: Height above street level 36 in., length 14 ft. back of seat.

Tread: 72 in. to outside of both front and rear tires.

Load: Limited only by capacity of tires and by road conditions.

Tires: Front 36 x 6 in., rear 40 x 6 in. dual, 40 x 12 in. Giants optional.

Trucks Make Good Hauling Sea Food in England

The possibilities of the motor trucks as a traveling store or salesroom is rapidly coming to be better appreciated in Great Britain, and more than one company has been formed to bring the latest selections of retail goods to outlying villages and districts. In certain lines of goods the idea has very strict limits and may easily be overdone, but the latest scheme for using motor trucks for bringing fish direct from the harbor to far inland villages and selling them direct to the consumer, ought to have a good future, for such means of transport are badly wanted, and the country folk will pay a good price for fresh fish.

Detroit One and a Half Tonner Adaptable for Farm Service

A-20, a 1½-ton job which is essentially an assembled proposition incorporating high-grade units of recognized quality. It is manufactured by the Detroit Transportation Truck Co., Monroe, Mich., and is a design that is especially adaptable for farm service. Being equipped with pneumatic tires it can capably negotiate the rough going of farms and outlying roads of rural districts. It has a wheel base of 138 in., giving a 115-in. loading space from the rear of the driver's seat. This distance does not include rear overhang.

This model is empowered by a four-cylinder Continental red-seal engine cast in block, having a bore and stroke of $3\frac{1}{2}$ by 5 in., respectively, and is suspended from three points. Ignition is by an Eiseman high tension magneto of the water-proof model, which is connected to $\frac{7}{8}$ -in. Champion spark plugs by extra heavy wires. Carburetion is by a 1-in. Stromberg of the horizontal truck type, that is attached direct to the cylinder block, a locational feature which is said to assure a uniform gasoline mixture and make

the rapid radiation of heat. Greater life is accorded the radiator by the utilization of side spring suspensions, which not only tend to lesson the vibration transmitted to it from the chassis, but also rear axle which is said to give exceptionally high clearance.

The front axle is a conventional I-beam section. The steering spindles of which are fitted with Timken bearings. The



New Detroit Model Equipped With Stake Body, Having Letter Panel and Cab
A loading space of 115 in. is provided

enables it to synchronize with the sway of the truck when going is rough. Cooling is further aided by fan having four blades. steering gear is a Ross heavy duty irreversible worm and gear construction with an extra large hand wheel. The wheels are of the auxiliary wood type and consist of 12 spokes with large hub flanges. Either solid of penumatic tires may be used. If solid tire equipped 36 x 3½ front, and 36 x 4 in. rear, are used. Pneumatics 36 x 6 front, and 38 x 7 rear.

The standard equipment includes a motometer, jack, tools, lamps and tool box on running board, provided with lock.



Front View of the Recently Introduced 1½-Ton Model A-20 Detroit Truck

This pneumatic-equipped job with its stake body and open cab is applicable to all nature of farm service. Note the springs on the radiator sides that cushion much of the shock that would ordinarily be transmitted to the radiator.

American La France to Build Commercial Motor Trucks

An announcement of interest to the motor trade is that the American-La France Fire Engine Co. has entered the field of the manufacture of commercial motor trucks.

The company is now completing its first series of trucks in its plant at Elmira, New York. These types comprise the following sizes: 5, 3½, 2½ and ½ tons, but for the permanent production of its commercial trucks the company has acquired a tract of more than twenty-three acres in Bloomfield, New Jersey, near Newark, on which a modern plant is now being erected, and which it is expected will be in active operation this summer.

In the design of its commercial truck, the company has followed the high standards employed in its fire apparatus along the most-approved and modern designs. All parts are manufactured in its own plant.

The company has branch sales rooms and service stations in the following cities: Boston, New York, Philadelphia, Atlanta, Pittsburgh, Dallas, Chicago, Minneapolis, Denver, San Francisco, Los Angeles, Portland, Ore., Toronto, Can.

It is proposed to carry a full stock of

It is proposed to carry a full stock of commercial truck parts in these service stations and prompt service will be for the commercial truck users.

starting easy when cold. Gasoline is fed from a 20-gal, tank which is of the welded steel round type, having a large opening for filling, and is provided with a sediment cup and drain at the bottom of the tank, by the Stewart Vacuum System, which is placed on the dash directly above the carburetor at the left side of the engine. The cooling fluid is circulated through a vertical tube radiator, which is made up of heavy cast tanks, rib flanged at the sides, top and bottom. This construction is designed to facilitate

Power is transmitted from the engine through a heavy disk clutch to a Detroit Gear & Machine Company transmission. This transmission consists of large shafts with heavy-faced gears and has a power take-off with side opening for power-driven tire pump. From the transmission the power is transmitted through a two-piece propeller equipped with heavy type universal joints to the rear axle. S. K. F. bearings are used to carry the shaft at the center under the cross members. Final drive is through a Russell internal gear

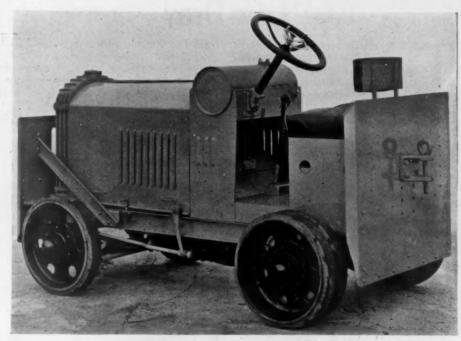
Towmotor, a Rugged Gasoline Industrial Tractor

An industrial tractor driven by a gasoline engine instead of the usual electric motor and storage batteries, known as the Towmotor, is the product of the Towmotor Co., Cleveland, Ohio. It is designed to tow or push standard trucks, load carrying vehicles or skids about manufacturing plants at a rate of speed of from 1 to 15 m.p.h. through as small as 7-ft. aisles.

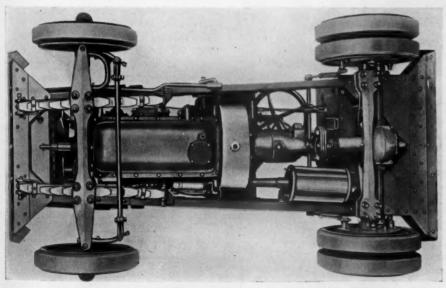
The Towmotor complete, which is a rugged all-steel machine, built of stanlard units, was constructed with an eye on the special requirements of an industrial hauling unit. It has sufficient capacity to move freight cars and still operate economically on light loads.

Power is furnished by a four-cylinder removable head, Weidely engine, with a bore and stroke of 43/4 by 51/2 in. respectively, in unit with the clutch and transmission. It has an S. A. E. rating of 22.5 hp. and is capable of developing 40 hp, at 2000 r.p.m. This engine is said to be particularly adaptable to heavy duty pulling, because of its flexibility and its ability to take high torque. All revolving parts move on large bearings. The engine parts are fully enclosed against the ingress of dust. Integral with the engine, is a centrifugal type governor, which is adjustable to speeds from 1000 to 2000 r.p.m., according to plant conditions. The force feed system of lubrication to all crankshaft bearings is employed. A fin and vertical tube type of radiator, with movable cores retained in cast sectional housings, is included in the type of drive mechanism. Fuel is fed by gravity from a 9-gal. gasoline tank, located amidships on the cowl, through a 1½-in. Schebler Model A carburetor, provided with a dash choke control for easy starting.

Power is transmitted from the engine through a 10-in. single-plate, heavy-duty Borg & Beck clutch to a standard selecternal gear type of drive. A construction, said to be very effective for both low speed breakaway pulls and light duty. It has a gear reduction ratio of 8:1. The front axle is of the Elliott truck type. Internal expanding type of brakes at the rear wheels are used, controlled by both a hand lever and a foot pedal.



Gasoline-Driven Industrial Truck-Tractor
Fuel is carried in a tank mounted on cowl. Note the sturdy bumpers



Power is Transmitted Direct From the Unit Power Plant to the Rear Axle

cooling system. Ignition is furnished by a 6-volt Delco battery system with spark lever control at steering column. A 6-volt, 120 ampere-hour Willard storage battery is employed in connection with the starting and lighting systems. It is mounted under the seat on rubber cushion blocks. Starting is through a 6-volt starting motor with automatic Bendix

tive type transmission, which provides three speeds forward and one reverse. The transmission control is of the standard automobile type with dust proof ball and socket pivot. The drive is transmitted directly from the transmission through a Thermoid-Hardy type of fabric joint to the rear axle, which is a special adaptation of the Torbensen inSteering is through a typical truck body type steering gear with sliding block steering column, which is connected to the front wheels only. Spark and throttle control and horn bottom are provided on this column. Semi-elliptic special steel springs are employed on the front axle only. The rear axle is attached direct to the pressed steel, 4-in. channel section frame. Cast steel disk wheels are used, equipped with solid rubber, pressed-on tires interchangeable front and rear. They measure 22 x 3½ for both front and rear, dual being used in the rear.

Heavy steel plate bumpers, front and rear, measuring the full width of the chassis, offers protection to the vital parts in the event of a collision or while employed in a pushing operation. Two large "U" sectioned couplings adjustable to four heights are attached to the front and rear bumpers. The couplings are simple in design, consisting of a heavy eye-head pin which is inserted through two holes in the ends of two projecting arms of the "U."

Engine torque and drive ratios furnish a drawbar ability approximately three times the tractive ability of the tires over average surfaces. Under average conditions this represents a trailing load of from 10 to 15 tons. By special hook-up and traction arrangement a larger per cent of the reserve torque of the engine can be utilized in exceptional cases, such as spotting loaded freight cars.

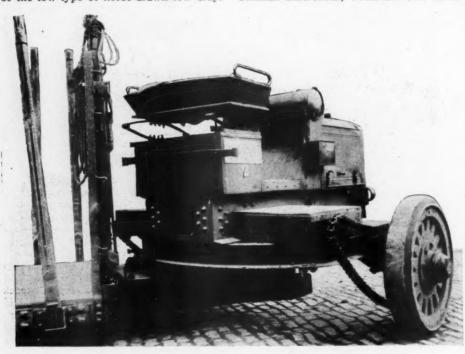
The following are general dimensions:

Weight, 3200 lb.; wheelbase, 60 in.; length over all, 90 in.; tread, 44 in.; width over all, 52 in., and turning radius, 10 ft. This permits practical operation through 7 ft. aisle intersections.

Nye Mercantile Tractor to Furnish Power for the Heavy-Duty Low-Dray

HE Nye Mercantile tractor, offered to the trade by the Hood Industrial Motors Co., Seattle, Wash., is designed to make a motor vehicle out of the low-type of horse-drawn low-dray.

from 4 to 6 m.p.h. with a capacity of from 6 to 15 ton. Standard parts such as the following: Ideal radiator, Oakes fan, Buda R. U. engine, Fuller transmission, Cullman differential, Goodrich 40 x 7 solid



Nye Merchantile Tractor

When assembled to the dray the tractor represents a complete, combined, power, control and steering unit. An unusually short-turning radius is also possible

To attach this mechanical power to the wood-bed dray, it is only necessary to remove the front wheels, tongue, and double-trees from the low-dray and connect it with the Nye Merchantile tractor, using practically the same king, as is used with the horse-drawn vehicle. Very little effort is required in attaching the two units. This mode of transporting unusually heavy merchandise is said to permit of a large saving in time and money as loading and unloading is comparatively easy in consideration of its low bed. The cost of maintenance for a year is also comparatively low, as the weight of the wood-bed truck is only about a third of its capacity. The Nye Mercantile tractor is featured by a recently invented engine steering device which makes the control of the machine practically automatic. This special steering arrangement utilizes the engine power to insure positive action.

As this tractor was designed for heavy intercity haul work its maximum speed is

tires, New Departure ball bearings, are used in the construction of this job.

The Nye Merchantile tractor is built in two sizes for $3\frac{1}{2}$ -in. and 4-in. rear axles.

Boyer Fire-Fighting Apparatus Mounted on Oldsmobile Truck

The Boyer Fire Apparatus consisting of two models the straight chemical and the combination chemical and hose, is manufactured by the Obenchain-Boyer Co., Logansport, Ind. This fire apparatus which is equipped complete with all the necessary parts essential for an effective fire-fighting machine, is mounted on an Oldsmobile Economy pneumatic-equipped truck. This truck can satisfactorily negotiate the streets of a city running at a speed of from 5 to 40 m.p.h.

The following is a brief resume of the specifications of the Boyer apparatus:

The chemical tanks are two in number and of thirty-five gallon capacity. They are of own make and made to conform to the Underwriter's approved pattern. They are made of open hearth, flanged steel, coated on inside and out and tested to 400 lb. to the sq. in. The tanks are especially fitted with by-pass and 21/2 in. connection, and so connected that one tank may be recharged while the other is being discharged. Water can be pumped on through the chemical hose without disturbing the tanks. Each tank is provided with one flexible agitator which works on bottom of the tank to dissolve the soda. A preventative to overcharging is insured by the provision of a safety charging flange on each tank. Registrations up to 400 lb. pressure may be obtained from gauges on each tank within easy reading distance. The hose body, which is strongly constructed of steel, has a carrying capacity of 500 ft. of 21/2 in. double jacket water hose. This body is thoroughly braced with wrought iron forgings and securely bolted to the frame. Access of air from all sides permits of the rapid evaporation of moisture from the hose. This thorough ventilation is possible because of the fact that the hard wood boards of the floors and side walls are assembled so that a 1/2 in. air space exists between adjoining boards. If only one chemical tank is desired, capacity of the hose body is 700 ft. of water hose.

The conveniently-located, well-riveted steel chemical box has a capacity of two complete charges. The 3-16 cotton web rubber lined chemical hose is 150 ft. long-



This hose is retained in a chemical hose basket made of woven wire, heavy steel, brass edge and has a capacity of 200 ft. Two ladders are provided. One 24-ft. extension ladder with safety hooks and one 12-ft. roof ladder with folding hooks in bracket.

Consideration has also been taken of the need of protecting the apparatus from splash by the provision of heavy steel body skirts extending from front to rear

on either side between the chassis and running board. The cushion and back of the seat is well-padded and upholstered and has hand-holds on either side. A substantially-built brass railing extending from the back of the front seat to the rear step with a cross-bar at the rear affords a sure and positive grip for the firemen. The rear step extended the full width of the apparatus and is substantially supported by a wrought-iron brace. On the

sides it is carried forward to meet the rear mud-guards and to protect the rear of the apparatus from splash.

The entire outfit is painted a Sagamore red with gold leaf and black striping, trimmings and ornamentations.

The equipment also includes lanterns, axe, tools, nozzle, eight complete chemical charges with instructions, signal system, portable extinguishers and nozzle holders.

Kearns-Dughie Brings Out Two Models

NLY units of recognized make are incorporated in the two new models recently brought out by the Kearns-Dughie Motors Company, Beavertown, Pa. They are of 34

in. overall, length 217 in. and the distance from the back of seat to the end of the frame is 120 in. The net weight of the chassis is 3300 lbs.

Although built along the same lines,

3/16 in. x 4 in. section, 180 in. long, with bumper built in front end.

Gasoline Tank—10 gallons capacity, located under driver's seat.

Wheels-134-in. hickory spokes, artillery type.

Dimensions—Overall, 180 in. Distance back of driver's seat to end of frame 90



and 1½-tons capacity. These jobs are also featured by special designed parts of own manufacture, particularly the radiator, which is a special design, having a cast shell with removable core, tube and fine construction. The Hotchkiss method drive is employed in both models.

The 11/2-ton model is fitted with a Herschell-Spillman engine having a bore and stroke of 31/2 x 5 in. respectively. The engine is in unit with the clutch and transmission. Cooling is through the Thermo-Syphon system, and the engine parts are lubricated by the pump and splash system. Power is transmitted from the engine through a Borg and Beck, adjustable, dry disk, clutch to an extra heavy truck type, sliding transmission, which provides 3 speeds forward and 1 reverse. Final drive is through a Torbensen internal gear rear axle. The front axle is of the conventional drop-forged I-beam section. Ignition is through a Berling high-tension magneto, and gasoline is fed to the Zenith carburetor from a 14-gal. gasoline tank located under the driver's seat.

The special heat-treated pressed steel frame, with channel sections measuring 5% in. by 2 in., is carried by semi-elliptic springs of chrome-vanadium steel 42 in. x 2½ in. in the front and 50 in. x 3 in. in the rear. Artillery type wheels are used, having spokes 1¾ in. diam. in the front and 2 in. in diam. in the rear. They are equipped with 34 x 3½ in. solid tires in the front and 34 x 6 in. in the rear. The screw and nut, irreversible type, steering gear with an 18-in. wheel, which may be mounted on either the right or left side, is used.

The wheelbase of this model is 136

Illustrating the Disposition of the Various Units.

and incorporating practically the same units, the 34-ton model varies slightly from the 1½-ton model. The difference may be readily seen by comparing

the following specifications of the 34-ton model with the description of the 1½ ton described above.

Specifications of Kearns 3/4-Ton Model Motor, Light—Bore 3½ in. x 4½-in. stroke, 4-cylinder water cooled. Thermo-Syphon cooling, pump and splash oiling. Radiator—Kearns special.

Transmission—Grant-Lees, 3 forward, 1 reverse, sliding gears.

Clutch—Borg & Beck dry disk type. Drive—Hotchkiss.

Axles—Torbensen internal gear rear, drop-forged front with Timken bearing.

Springs—Semi-elliptic, chrome-vanadium steel, 37-in. front, 50 in. long back, 2-in. wide.

Ignition—Berling high-tension magneto.

Starter—Dyneto two-unit type, with Bendix drive in starter.

Tires—Firestone, 32 in. x 4½ in. front and rear.

Carburetor—Zenith. Wheelbase—118 in.

Steering-Lavine gear, right or left side installation.

Frame-Kearns specially heat-treated,



in. Net weight 2000 pounds, boxed for export 3000 pounds, box cubic feet 190. Governor—Monarch.

Motor Hearse is Not a Passenger Car

WASHINGTON, April 1 .- The internal revenue division of the Treasury Department has decreed that a motor hearse is no longer classed as a passenger car under the excise tax law. Instead of 5 per cent hearses are now taxed but 3 per cent. The new ruling is due to the vigorous and very comprehensive summing up of the case for the hearse by David J. Neven, acting for the Michigan Hearse & Motor Co. He sums up his arguments: "A motor hearse is specifically designed, constructed and adapted for the carrying of a box or coffin, containing a 'body'one at a time-from some given point to a cemetery. We contend, that unlike an automobile it cannot by even the wildest flight of fancy, be designated as a pleasure car, and we submit that it never is, and never can be, used for pleasure purposes by its involuntary occupant."

Magnificent Display of Trucks at the Boston Show

Dealers From All Over New England Visit the Boston Exhibit Which, in Point of Attendance and Character of Displays, Outclassed All Similar Events This Year

HE combination passenger car and truck show held this year in Boston under the able management of Chester I. Campbell was without doubt the most interesting and most complete exposition of both classes of highway motor propelled vehicles ever staged in this section of the country. Even though the truck exhibits were placed in the basement of the Mechanic's Hallwith an overflow exhibit in the South Armony-the combination show was the means of getting the dealers to take in both sections of Mechanic's Hall. With his curiosity aroused after seeing everything in the aforementioned building, he was not content until he saw all of it. Hence the short walk to the South Armory was not considered burdensome and he was amply repaid, as here again he was confronted with a layout which was a little show all by itself.

In this building about a dozen truck exhibits occupied the center of the hall, while wall spaces were taken up by truck equipment and accessory displays.

Luckily the show week was accompanied with good weather. Even though the opening was not extremely favorable from the weather standpoint—it did not

deter the crowds from piling into the building. In spite of the drenching rain, over 35,000 persons crowded the hall the first night, the largest number ever attending an opening in Boston.

Although more or less a dealer's show, it was interesting to note the large number of factory representatives that were present and with nearly 2000 dealers in attendance the show was a pronounced success. The record-breaking dealers' attendance was due largely to the enormous demand for passenger cars in the New England territory, where incidently there are about three buyers for every car. The double show gave these dealers to acquaint themselves with the truck field which was represented by sixty-nine makes, with a sprinkling of tractors and trailers.

Most of the makes which were exhibited at New York and Chicago were also shown at Boston through their dealers. In the line of new things there was little to be seen by those who followed the National Shows in Chicago and New York, but to the New England dealer the show was a treat for sore eyes.

Among those makes which made their first appearance at this show were the

Capitol, the Northway, the Walker-Johnson and the Reynolds, the first three being New England products.

The Capitol truck is manufactured by the Capitol Motors Corporation of Fall River, Mass., in two sizes, Model B, 1 ton, and Model C, 2½ton.

The Northway was shown by the Northway Motors Corporation, with factory at Natick, Mass. This truck is powered with a Northway engine, and the equipment includes an electric starting and lighting system.

The Walker-Johnson was exhibited by the Walker-Johnson Truck Co., Woburn, Mass. It is a 2½-ton job, the specifications of which include a 4½ x 5½ Buda engine; worm drive; 150-in. wheelbase, and 36 x 4 front and 36 x 8 rear pneumatics.

The Reynolds truck built by the Reynolds Motor Truck Company, Mt. Clemens, Mich., was shown in four sizes, 1½, 2½, 3½ and 5 tons.

Two new Sterling models were shown by the New England distributor, F. O. Johnson. These are of 5 and 7½ ton capacity. The outstanding features of these models are a combination of both



The Basement of Mechanics' Building Was Crowded With Trucks

speed and power, embodied in the addition of extra speeds, both forward and reverse. These trucks have six speeds forward and two reverse. Three speeds of a standard transmission are doubled

or multiplied by a two-speed jackshaft, which gives the truck two direct drives, with six equally graduated speeds forward and backward. This double range—the lower for power and the higher for speed—enables the driver to operate the motor at its greatest efficiency under constantly varying road conditions.

The Jackson was also seen at this show for the first time. This truck is built by the Jackson Motors Corporation, Jackson, Mich. This make was shown in 3½-ton size. It is built by the Jackson Motors Corporation, Jackson, Mich. This make was shown in 3½-ton size. It is a four-wheel drive model and was described in detail in our November, 1919, issue, page 50.

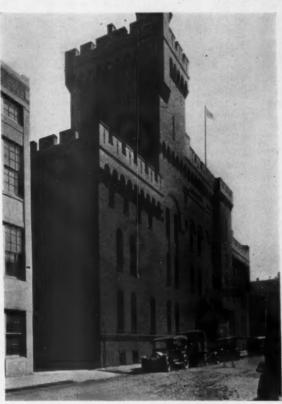
Tractors were shown for the first time at the automobile show here and great interest was taken in these farming utilities. The exhibits were in the basement of the main building and at the Armory and were inspected by large numbers of New England farmers.

The exhibitors were kept busy answering questions from those interested and all of those who displayed tractors and tractor implements reported many excellent leads and some sales.

At the Cletrac exhibit were shown Oliver plows, harrows, etc., and this

display as well as the demonstration on the street was well patronized. The Beeman Garden tractor was also shown. At the booth of the Midwest Utilitor were three tractors, one of which was a cutaway, showing the components, an exhibit of educational value to those familiar with tractor design.

Among the other exhibits of unusual merit was the New Britain and Traylor.



The South Armory, Boston
Where the remainder of the trucks were shown

The Fordson was shown in the basement of the main building in connection with the Ford commercial car.

The exhibits of accessories, equipment, supplies, time and labor-saving devices,

were fully up to the standard of past years. There was very little new in truck equipment. Just the same, however, the repairmen and garagemen found many interesting exhibits of time and labor-

saving tools and machines. The Boston show is always noticeable for the artistic decorations and this year was no exception to the rule. The use of numerous mirrors, floral vines and pendants of colored light in the Mechanic's Building occasioned much favorable comment and provided a rich setting for the cars. An Arcadian Fete was the plan in the grand hall. The drop back of the stage represented the hillsides of Annapolis Valley, while myriads of apple blossoms were seen in every direction. Rockeries and ledges with a sprinkling of trees concealed the stairways and approaches to the stage.

The tree effect was utilized with the balconies and supports and hung with blossoms and sprays and illuminated by ingenious lighting produced a most beautiful effect. Huge arches of leaded, colored glass were featured in the promenade and they were lighted from the interior. The supporting columns and pilasters contributed to the effect. The lighting scheme in the Armory was excellent.

While there were luncheons and dinners during the week, the number did not compare with former years. Several dinners were given to the dealers by the factories or distributors, and at these events there was a decided optimistic note.

Chester I. Campbell, who has staked the annual Boston Show since its inception, went on record as stating that it was the biggest and best show ever held in New England. And it was.

Massachusetts Motor Truck Club Dines

One of the events during the show was the first annual banquet of the Motor Truck Club of Massachusetts which event was attended by about 300 members and guests. This organization was started less than three months ago and is growing very rapidly in membership. The banquet was held early in the evening to allow the members to attend the truck show in a body as guests of the management.

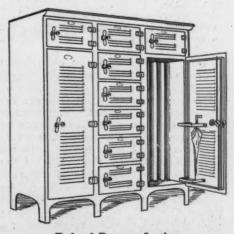
The principal speaker of the evening was commissioner John N. Cole of the Department of Public Works, which regulates trucks and constructs highways. Among other points brought out by the speaker was the need of plans for coping with snow next year and it was stated that a program is being worked out whereby the main highways will be kept open another year. The speaker touched on the importance of the motor truck in transportation and its utility to the industries of New England. He also stated that the rates of the common carriers on what is termed the short haul were to be materially increased, that the truck must replace the railroad in this work and solve the congestion at the freight terminals.

The members of the Roads and Bridges Committee of the legislature were among the guests. David Harper, first president of the Motor Truck Club of New Jersey, was the other speaker. He described the activities of his organization during the war and said among other things that the New Jersey highways were kept open this winterwinter despite the severity of the storms. He also explained how the club obtained better and cheaper insurance and protected its members against the adverse legislation of other and adjoining states.

The success of the evening is due to the efforts of a committee comprising Day Baker, chairman; John M. Potter, Norman H. Halliday, James F. Scully and Dwight W. Sleeper.

New Hart and Hutchinson Metal Locker

A recent addition to the Hart and Hutchinson, New Britain, Conn., line of steel lockers, which was exhibited at the Boston Show, is a new locker known as the Federal Reserve Type locker. It is an all-steel construction, built in a unit to conserve space, and will accommodate clothing, lunches, etc., of eight men. This locker is divided into two compartments, one at each side, each of which is sub-divided into four spaces for



Federal Reserve Locker

This unit will accommodate eight men. It is an all pressed-steel construction, well-ventilated and each compartment provided with special locks.

clothing. Above each of these is a hat compartment and in the center another row of six similar hat compartments. An umbrella rack with drip-pan is provided on the inside of each door. All doors are fitted with special locks and the locker is thoroughly ventilated. It is 54 in. wide and 21 in. deep and 78 in. high. This cabinet sells for \$65 in single lots, f.o.b. New Britain, Conn., with reductions if bought in larger quantities.

Copithorn Three-Piece Rim for Truck Pneumatics

The Copithorn Manufacturing Company, 80 Boylston Street, Boston, dis-played the Copithorn three-piece rim for truck type pneumatics, and the rims present interesting features in that in removing a tire the rim is removed from the tire, whereas in conventional practice the process is reversed.

One of the features of the rim is that the old rim, irrespective of type, can be changed over to the Copithorn design by the truck dealer's repairmen. This is accomplished by making three cuts, attaching the studs, locking plates and lock. Jigs are supplied, and a saw and drill if desired. It is stated that a set of truck rims can be changed over in from three to four hours, and that there is a net profit of about 60 per cent. list price per rim varies from \$10 to \$15.

The conversion of the ordinary rim to the three-piece is made by making three cuts equidistant, and a jig is supplied for this work. A locking plate is attached to each section and 45 degree angle studs. Semi-circular openings in the plates register with the studs, and the three sections, when completely assembled, are locked by a locking plate operated by a screw

to market new rims in which the Copithorn principle will be incorporated. Among the advantages claimed for the rim is that the giant tires can be easily removed or replaced, that bending of the rim is eliminated and that the possibility of injuring the fabric is avoided.

Kraeuter Crank-Pin Turner

A new hand tool for truing up and resurfacing crankshaft pins, bearings, shaftings, etc., is the Kraeuter crankpin turner, which is manufactured and was exhibited at the Boston Show by the Kraeuter & Co., Inc., Newark, N. J. This tool, which is operated by hand, is especially adaptable for garage and repair shop work. It is said to turn around within .001 of an inch and has a capacity of from 11/4 to 21/2 in. diam.

With this tool oval crankpins can be accurately and quickly refinished and prepared ready for new connecting rod bearings without the use of other tools.

The method of operation is simple, the work being placed in a vise, over which the device is placed. It is then turned



ing an adjusting screw that can be locked when the proper place has been found. After the work has been run over by this tool once the blade can be adjusted to take a deeper cut for finishing it. Oil holes in the crankpin should be plugged with wood or waste and if the surface of the pin is glazed, this should also be removed with emery cloth.

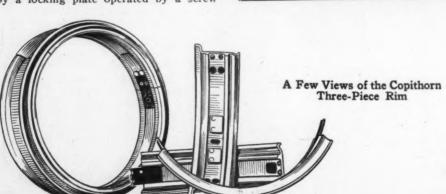
The tool is forged from special alloy steel and the cutting blade, which is made with a fillet of 1/8 in., is made of Iroquois Gold Label steel. It sells at \$45 f.o.b.

Newark.

Badger Truck Jack

The two Badger jacks representative of the various types included in the large Walker line of jacks and exhibited at the Boston Show by the Walker Mfg. Co., Racine, Wis., Models No. 5 and 55, are designed exclusively for the motor truck.

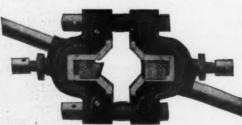
The Badger truck jack No. 5 incorporates the standard Badger construction. The standard Badger lines of construction, which includes drop forged pawls and steel reversing parts, are followed in the design of this jack, differing only in that they are made of extra heavy metal throughout. Even though this jack may be loaded to its capacity, which is three tons, lifting is comparatively easy, because of the heavy bearings and the provision of long leverage. It has an extra large base and is 111/2 in. high with a lifting length of 121/2 in. It weighs 14 lb. and sells for \$9.50.



When locked the construction is practically as substantial as the original rim.

To remove the rim from the tire the locking device is turned with the screw driver and the sections displaced one by To reassemble the process is reversed, and this can be done with the conventional locking ring. One of the features that should appeal to the truck dealer merchandising pneumatic tires for trucks is the small investment required to stock the locking plates, studs and locking member and the possibilities of a quick turn over. At present the makers of the rim are supplying the parts for changing over the rims, but later intend

by hand in a manner similar to that employed when cutting a thread. The cutting plate is brought in contact with the work at the highest point by manipulat-



Kraeuter Crank-Pin Turner A hand tool for truing up bearings, crankshafts, etc. Specially useful in repair shops for shafts which have worn elliptical



The Badger Truck Jack Model 55 Note the footlift which permits this jack to be used in tight places

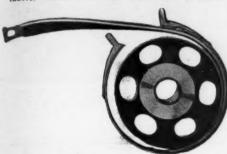
The Badger 5-ton truck jack No. 55 is the embodiment of strength and power. The rack bar pawls are forged steel and are carried by hardened extra large steel

A broad substantial 5 x 8 in. base is used to prevent tipping of the jack while in use. Extra long leverage is provided by a 24 in. heavy hickory handle. Provision has also been made for the meeting of emergencies by a footlift, which increases the range of the jack. This jack is 141/2 in. high with a lifting length of 634 in. and weighs 28 lb. It sells for \$17.

Raydex Reliner for Fords

A new tool designed for the purpose of cutting down the time required in relining Ford transmission brake bands, and known as the Raydex reliner, was exhibited at the Boston Show by Geo. W. McBride & Co. It is manufactured by the Raydex Mfg. Co., Brakenridge, Pa.

The reliner consists of a cold rolled steel band to which is riveted friction fabric. Holes in the two ends of the



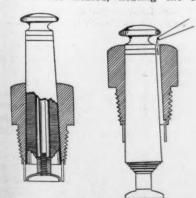
Ford Raydex Reliner

The reliner for Ford transmission is a hardened cold rolled steel band, to which a friction facing is riveted. It can be slipped in place by simply removing the transmission hand cover plate.

bands through which the pedal shaft passes, retains the reliner in position after being applied. Before attaching the reliners, it is necessary to move the old Ford bands, which requires the taking off of the top of the transmission case. After these bands have been properly placed, all that is necessary is to remove the cover plate, slip the pedal out of the way, slide the band between the brake band and drum, and slip the pedal with its shaft back into position, which locks the band in place. Little tabs or ears on the end of the band which is first inserted eliminates the necessity of tearing down the transmission whenever it is necessary to replace a band.

P & P Exhibit Hot Electrode Spark Plug

The feature of the new spark plug manufactured by Page & Pohle, Lynn, Mass., and exhibited at the Boston Show, is the construction of the central electrode which terminates in a disk. This disk becomes heated, heating the sur-



P & P Spark Plug

olug is so designed that the central electrode,
terminates in a disc, becomes heated to
ignition of the mixture in proximity to it.

chand view shows core depressed for priming

rounding mixture, thereby increasing its combustibility as the vapor becomes more highly vaporized, a favorable igniting condition. This plug is claimed to remain free of carbon deposit indefinitely.

Another feature is the use of the plug for priming. The core of this plug is of taper construction and by tapping it on the top, the insulator core drops sufficiently to allow squirting gasoline in around the core directly into the cylinders. The first explosion of the engine forces the core back into its proper position and each succeeding explosion forces it home more securely, making, it is claimed, a perfectly tight seat.

The ½-in. Ford type sells at \$1.25 and the ½-in., 18 or S. A. E. standard at \$1.50.

New Brunner Air Compressor No. 45

To meet the increasing demand for an air cooled compressor for inflating large pneumatic tires for trucks as well as one having a wide range of industrial applications, the Brunner Mfg. Co., Utica, N. Y., is marketing a new type. The No. 45 is a double cylinder, vertical model and includes a 1½ hp. motor on a cast iron base. The compressor and motor are direct geared by means of a cut cast iron spur gear and a cloth driving pinion. The gears are enclosed.

The compressor embodies the same simplicity and sturdiness that characterizes the Brunner line. The cylinders have a bore of 2½ in. and a stroke of 3. The speed is 325 r.p.m., and with standard motor has a guaranteed pressure of 175 lb. per sq. in., although higher pressures are supplied on order. The capacity is 5½ cu. ft. of free air per min. Lubrication is by a splash system and the motor bearings are lubricated by ring oilers on the shaft. The height is 20 in., and the floor space required is 22 x 26 in. The net weight is 310 lb., shipping weight 360 lb. The finish is gloss black enamel.

The compressor was developed to meet the requirements of truck tire service and for use where low temperatures prevail and where a water cooled design is not favored. The unit is well adapted to automatic control as it has a low peak

load which relieves the gears from excessive stresses and makes it possible to start against tank pressure. Motors are supplied to meet varying current installations.

New Brunner Compressor

Designed especially for truck tire service, although has wide range of applications in industrial lines.

Shotwell Gasoline Pump

A new pump of the continuous forward stroke measuring type, that can be used in connection with a storage tank of any capacity and is designed to discharge fifteen gallons of gasoline a minute, is one of the new products exhibited by the Shotwell Pump & Tank Co., Boston, Mass., the manufacturers at the Boston Show. The quantity of discharge is registered in quarts on a dial over which the

indicating hand moves from zero up to twenty gallons. After the hand has completed its first cycle it can be made to repeat automatically or it can be reversed at any point to return to This tank is zero. equipped to permit of a two-way discharge, one for cans or direct to automobile tank by way of hose. The hose is supplied in 7, 8 and 10 ft. lengths.

The following dimensions are in connection with pump No. 50: Height over all, 54 in.; floor space required, 14 sq. in.; distance floor to nozzle, 30 in.; center to center, 16 in.; center



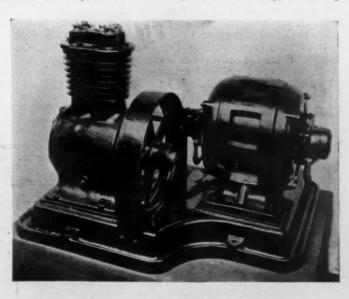
Shotwell Measuring Pump

of pump from rear wall, 12 in.; center of pump from side wall, 9 in.; suction line, 1½ in., and discharge line, 1 in.

To facilitate accurate bookkeeping the company provides as extra equipment a 100-gal. meter, which keeps an accurate record of all gasoline discharged, whether discharged in gallons or quarts.

Kant-Rust Spring Lubricant

Kant-Rust, the name of a new liquid manufactured and exhibited at the Boston Show by Cee-Vee Products Co., 107 E. 59th St., New York City, has many



uses, such as preventing springs from rusting and in service work for releasing rust bound nuts, bolts, brakes, cotter pins and tire rims. This composition, which can be applied with an ordinary oil can, consists of oil having unusual penetrating qualities and graphite, which is carried by the oil and spread over the rusty surface, coating the same with a light film of graphite. The application of this liquid to parts is said to prevent rust or if already rusted it will remove the rust.

Kant-Rust is put up in screw-top cans. Sixteen-oz. cans sell for \$1 and gal. cans for \$4.

Mr. Dealer: What do you know about hoists? All kinds of hoists for motor trucks will be described in our next issue



The Walker-Johnson 2½ Ton Model Shown at Boston For complete details see Specification Table in this issue

The Right Kind of a Body Helps Sell Trucks to Farmers

By H. B. ROIE

"TOHN," said Ned Baldwin to Frank Randall, the local dealer, "I have come to the conclusion that we are going to need a truck down on the farm. You see, help is too scarce and high priced that we have to have something that will take our crops to market in the quickest possible time."

market in the quickest possible time."
"Come right over here," replied Frank.
"We have just the truck you need. Here
is a truck all fitted with a body that will
fill the bill."

"What you say about the truck sounds all right, Frank, but the body won't do. I have been trying to find the step-ladder that goes with it. That body is so high that we surely will need one in order to get the load on."

That is about the way the farmers feel about the average body that is sold on farm trucks. Talk with the average farmer about trucks and the chances are ten to one that the first question he will ask you, is what you have in the shape of bodies, which goes to show that he isn't so much interested in the chassis as he is in the rig you have to go on top of it. Any good make of truck sounds all right to him, as he figures he has to take the dealer's word for it, anyhow, but he does know what he requires in the way of a body.

Farmers are bound to be one of the largest users of trucks. Transportation is a problem with them, the same as it is with the wholesaler, the manufacturer or the contractor. Not only does he require the truck to market his products, but he needs the truck right at home to haul his crops in from the fields.

Special attention has been paid to the bodies used by contractors and other users of trucks, but the body for the farmer has apparently been neglected, notwithstanding the fact that the government survey taken last year showed over 50,000 trucks, exclusive of converted passenger car chassis fitted with truck bodies or trailer, in use by farmers. Their requirements are so versatile that the body makers should study the matter and build a truck body that answer every purpose. With this wonderful market before them, it certainly is going to be worth

What the Farmer Wants

To begin with, it should be remembered that the farmer doesn't have a loading platform out in his field, even if the height of some truck bodies should so indicate. What is more, he undoubtedly does not have one anywhere on the farm. What does the average farmer do with the truck right out on his farm-other than hauling to market. He uses it to haul in the potatoes from the field, the apples and fruit from the orchard, grain from the field, and possibly he uses it to haul in hay. In transportation he hauls the potatoes to market, likewise the fruit, he carries the stock that he has finished off, he hauls grain and baled hay, and if he is running a dairy farm he hauls the milk to the railroad or receiving station. These are a few of the reasons why the farmer is so interested in the truck body. Show him the average truck body and he commences to lose interest in trucks. Why?

To the man who has worked out in the field or orchard loading bushel crates of potatoes or fruit, or barrels of apples, the reason is apparent. The average truck body is bolstered up too high. The farmer isn't looking for something that is going to make his work harder. He wants something that will get him away from that everlasting lifting. I was talking with a salesman the other day and

he remarked that the farmers are lazy. True, you will probably find some that are. The same might be truthfully said about salesmen. Fifty pounds doesn't sound like much of a lift, but lift forty bushel crates filled with potatoes weighing 50 pounds each up onto a platform that is six inches higher than it should be, and you'll say it is no light work, or try loading a truck with fifteen barrels of apples containing 150 pounds of apples each, and the chances are you will wish the body was two feet lower instead of six inches higher.

The Farmer's Work Varies

As I have said, the work on the farm is so varied that the work should be studied and a body designed that will fit into the average farm work. The farmer may be hauling sand and gravel today from a nearby gravel pit so that he can do some concreting around the barn; tomorrow he may want to take a load of hogs to market, while next week he will be hauling in hay from the field. With the farm wagon he doesn't use the same rig for this work. If he is hauling gravel, he puts on the "dump" boards, if he is taking stock to market he puts on a "stock rack," while for drawing in hay he puts on the "hay rigging." Some of the bodies that are sold on farm trucks answer the purpose just about as well as though the dealer who sold him a farm wagon expected him to haul his hay and do all of the other work on the farm, with the box with which the wagon was sold.

The farm field is so promising that the same attention should be given in designing farm truck bodies that has been given to bodies for other special work. It will go a long way toward motorizing the farm, which means a larger crop acreage and more food.



SERVICE AND REPAIR DEPARTMENTS



The Factory Method of Overhauling the Detlaff Model H Clutch

By C. P. SHATTUCK

HE following methods are employed at the factory of the A. J. Detlaff Company, Detroit, for the disassembly, repair, reassembly, adjustment and lubrication of the Detlaff clutch made by this concern. The instructions given herein are for the Model H clutch, which is constructed with from three to nine driving plates, affording a total of from six to eighteen engaging surfaces, and the directions may be utilized with all Detlaff Model H clutches, as the principles are similar.

The Detlaff clutch is of the dry disc type. The torque is transmitted to the driven plates through 88 involute teeth, thence through frictional surfaces to the driven plates, from whence it is communicated to the driven drum through 60 involute teeth.

Construction of Clutch

The components of the Detlaff clutch and their installation are as follows:

Outer Drum—Driving member which transmits torque to the driving plates. Its flange is bolted to the flywheel by cap screws and lock washers.

Inner Drum—Carries the driven plates and is secured to tapered shaft by key. Is locked by a spacer, castellated nut and cotter pin on clutch shaft. The driven member.

Release Bearing—Has bearing sleeve which is screwed in pressure plate, and is locked by screw and wire. Housing has a brass thrust washer and ball bearing thrust.

Pressure Plate—Has three long hex headed screws (adjust tension of springs) extending through inner drum and carrying three coil springs under compression by a spider.

Lock Plate—Disc with involute teeth fitting in locking ring on toothed drum. Has two pins or

studs with lugs and cotter pins.

Driving Discs— Have teeth cut in their periphery and faced on both sides with friction material.

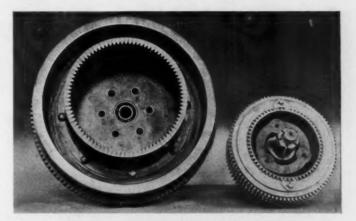
Driven Discs— Smooth, metal discs with a plain periphery.

Removing Clutch from Engine

To remove clutch from power plant proceed as follows: Unbolt bell housing from engine. Pull bell housing with

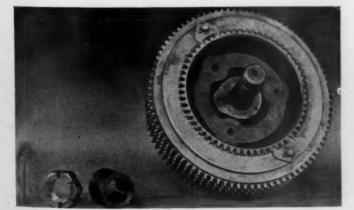
clutch as a unit outof the driving drum. There is an annular ball pilot bearing in the flywheel, a No. 205. It carries the free end of the clutch shaft. This shaft is removed with the clutch and as a unit.

Place clutch assembly on the bench. Remove the large cotter pin locking the castellated nut on clutch shaft. There is a pin hole through the shaft. Remove the castellated nut (right hand thread), using a No. 40 standard open end wrench or one having an opening of 1 11-16 in.



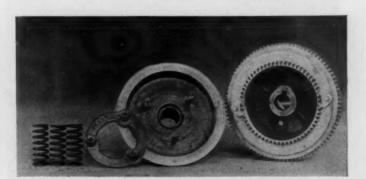
The Outer Drum (at Left) Carries a Pilot Bearing Supporting the Free End of Clutch Shaft

The clutch is shown (at right) with cotter pin, castellated nut and spacer on clutch shaft of the drum assembly



Showing the Cotter Pin, Castellated Nut and Spacer Removed From Clutch Shaft and Inner Drum Assembly With Keyway in Shaft

The locking plate is secured by lugs on studs



Parts of the Clutch

Showing coil springs, spider, pressure plate with hex-headed screws. Inner drum with holes through which screws extend and keyed hub of inner drum. Key must be flush with face of hub when replacing spacer

Take spacer off shaft which is tapered and has a keyway. To remove the shaft, strike small end a light blow with a lead hammer. Do not use other than a lead hammer. The shaft is now loose. Pull clutch off the shaft.

Disassembling Pressure Plate

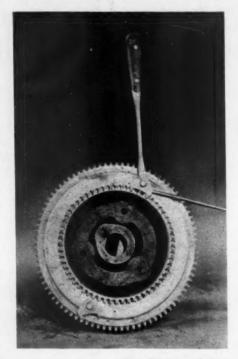
Use of an arbor press or C clamps will be necessary in the disassembly of the pressure plate; that is, the three coil springs will have to be sufficiently compressed so that the hex heads of the three screws or bolts will extend at least 1/4 in. beyond the surface of the plate. While the screws can be displaced without the clamps or arbor press, the work will be simplified and more quickly accomplished by using the methods described, for the screws have wings beneath their heads which engage with corresponding slots in the pressure plate, locking the screws. If the press or clamps are not used, but half a turn at a time can be taken on each screw because of the locking device.

Maintaining Correct Spring Tension

Previous to removing the pressure plate it is suggested that steps be taken to observe the tension of the coil springs. The screws (adjusting members) are of 16 pitch and one-half turn or rotated through 180 deg. is equal to 1-32 in. (measurement) increase in tension. It is highly important that the tension on all three springs be exactly alike, exerting the same pressure on the plates-it is best to measure. Use a metal scale and measure from the bottom or recess on which the bottom of the spring rests to the top of the spring or to the underside of the spider. It should be alike on all three springs. This method is suggested as it will save experimental adjustment of the clutch after it is replaced.

Place clutch on table of the arbor press with the release bearing side down, as shown in an accompanying drawing. Place a small piece of wood about the size of the spider on the spider. Compress springs until hex heads of screws extend about ½ in. beyond face of plate. Use a No. 27 wrench (11-16 in.) to loosen or unlock screws. Remove screws.

Remove spider and the three coil springs. Lift off the driven drum with plates intact from the pressure plate. Remove cotter pins from pins or studs (2) on lock plate which is secured by lugs, each having two teeth that mesh with



The Locking Lugs Are a Snug Fit, But Can be Easily Removed by Using Screw-Drivers.

the inner drum assembly. These lugs are a snug fit on the pins and use of two screw drivers will be necessary. Force end of blade between plate and lug and tip of blade of other tool under the small



Showing the Release Bearing End of Inner Drum Assembly and Bearing Housing With Dowel Holes

end of lug, as shown in an accompanying illustration. Exert even pressure and pry off lug. Remove other lug in the same manner.

Unlocking the Locking Plate

Place the assembly on the bench with the locking plate side up. Rotate this plate either to the right or left one-half a tooth or until the teeth of the inner drum mesh with those of the locking plate. Lift off the locking plate or ring. Next remove a driven disc (smooth), then a driving disc (friction faced), and so on until all discs are displaced. The last to be removed will be a driving disc. It is important that the order of removal be observed, so that correct replacement will be made. By reversing the process outlined no mistake will be made.

There should be no reason other than abuse or neglect for disassembling the pressure plate completely. If this must be done for renewing a component, proceed as follows: Clamp pressure plate in the vise. Remove or slip lock wire that holds lock screw in bearing sleeve. This screw locks the sleeve in the pressure

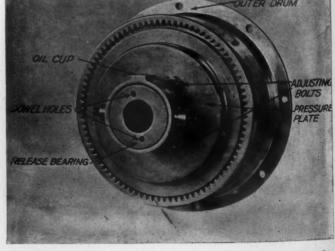


Showing the Order of Removal of Driving and Driven Discs and With Locking Plate Last and at Extreme Right



From Left to Right: Release Bearing, Bearing Sleeve With Ball Thrust and Pressure Plate With Screws Inserted Loosely

Note the locking screw on hub of pressure plate and locking wire

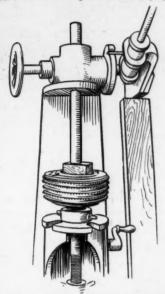


The Model H Detlaff Clutch Removed From Flywheel and Parts Lettered

plate. Remove screw. The bearing housing is screwed in the hub of the plate and the housing has two dowel holes. At the Detlaff factory use is made of a special spanner wrench with two pins which register with the dowels. Unscrew bearing housing and take out. Note the assembly. It has a brass thrust washer and a ball thrust bearing.

Reassembling Detlaff Clutch

Before the reassembling of the components see that pilot bearing in the flywheel is cleaned and repacked with grease. Clean and pack with cup grease



Using Arbor Press for Relieving Spring Tension

the brass thrust washer and ball thrust bearing of bearing sleeve assembly. Replace plates, starting with a driving disc, then a driven disc, alternating. The last plate should be the locking plate. An accompanying illustration shows the plates removed and the order in which they are assembled.

Replace locking ring and rotate onehalf tooth to lock it. Replace the two lugs on studs and cotter pin both. Replace three coil springs and spider. Insert the three screws. Use arbor press or C clamps as previously described and compress springs. Adjust to the measurement which should have been noted. Adjust all three springs alike.

Replacing Shaft

Replace key in shaft. In assembling shaft in drum it is very important that the key does not project. It must be flush so that there will be no space between the spacer and the hub of plate or drum. In other words, key must not extend beyond face of hub. Replace spacer, castellated nut and cotter pin. Insert clutch in driven drum with bell housing. Bolt assembly to engine.

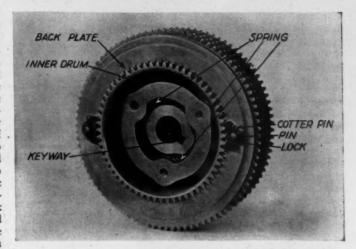
There are two types of facing employed in the manufacture of the Detlaff discs. One is a woven facing which is subjected to 60 tons pressure after the facing is attached to the disc. This obtains a surface accurate to within .005 in. The facing is first riveted by a special machine, then pressed.

The other type of facing is a moulded material which is riveted to the plate. The surface is then ground on a special machine to remove scale and to insure accuracy. The co-efficient of friction or pulling power of. both types is said to be the same. Should it be necessary to replace a faced disc one should be obtained from the truck manufacturer. It will be cheaper for the dealer and result in considerably less cost than any attempt to reface the disc with

some friction material for the reasons given; i. e., the even bearing surface obtained by special machinery is highly desirable

Adjusting Detlaff Clutches

Adjustment of the clutch after installation or during service is accomplished through the hand hole of the bell housing. It is highly important that when increasing the tension of the springs that the same number of half turns be given each screw. For example: If one screw be given a turn (a click will be heard after each half turn) give the other two a half turn or turn until one click is heard. Uneven turning or adjustment is responsible for wear of the facings owing



Showing Inner Drum Assembly, Spider, Coil Springs and Other Components

to the uneven tension exerted on the friction material. Where trouble of this kind is encountered it is suggested that the springs be measured as described.

Lubrication

The release bearing is provided with a cup which receives oil through a tube passed through the bell housing. This tube should be extended to a fluid oil cup located at a convenient point, and the feed or supply should be regulated to deliver about one drop per minute to the bearing. Any good engine oil is recommended. These instructions for lubrication are those supplied by the Detlaff company to the truck manufacturer.

The Lauraine Impulse Starter. Its Lubrication and Care

HE Lauraine Magneto Co., Inc.,
Long Island City, N. Y., is
manufacturing two types of impulse starters for its truck magnetos. One is known as the rigid type
and affords an impulse every 360 deg.
The other, which differs from the rigid
in that there is no inside catch but has
two arms actuated by centrifugal force
instead of one, thus giving an impulse
through 180 deg. Both are automatic in
their operation. One of the features of

The Lauraine Driving End-Plate
The steel shaft of magnete is cast integral with
plate to avoid possibility of loosening

the rigid type is that it can be locked and made to function as the conventional magneto coupling.

Simple Design

The impulse starter is simple, very compact and sturdy in design and can be used in connection with the magneto where standard dimensions are adhered to. The impulse starter consists of a shell (the driven member), a cam (the driving member), a coiled spring, flange separator, two washers, a nut, a gravity latch and an Oldham type of coupling. The shell has a hub with keyway and is keved to the armature shaft of the magneto, replacing the conventional driven member of the ordinary coupling. The ends of the coiled spring are hook shaped and the outer end engages with a notch in the shell in which the spring is placed. The other engages with a slot in the hub of the cam member.

How Gravity Latch Functions

A gravity latch pivoted on a special stud in the magneto housing drops into a notch in the shell, holding this member stationary when the engine is cranked.

The cam, which is driven by the engine drive shaft through the coupling, however, continues to rotate, winding the spring. The spring is released by a cam on the periphery of the cam member, the cam throwing the gravity latch out of engagement with the notch in the shell, releasing the latter, which, being attached to the magneto shaft rotates the latter at a high rate of speed, until the shell encounters the cam stop. This operation is repeated until a speed of from 100 to 150 r.p.m. is attained when an arm pivotally attached to the cam is thrown out by centrifugal force, and contacting with the gravity latch prevents the latter from engaging with the shell notch.

Will Operate if Spring Breaks

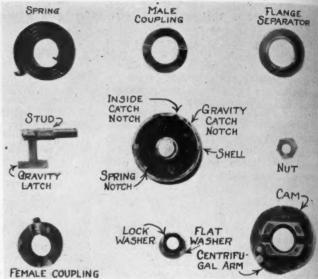
At the same time an inside catch, which is mounted on the same pin or stud as the centrifugally operated arm, is thrown by centrifugal force into a notch in the shell. This locks the cam with shell providing in effect a solid coupling. Should the spring break the impulse starter can be made to function as a conventional coupling by moving outward the centrifugal arm and tightening the hex headed screw attached to the arm. This is accomplished with the magneto wrench used for adjusting the contact points. A recess is provided in the cam member for the screw.

Disassembling Starter

In the event a broken spring is to be replaced with a new one proceed as follows: Loosen magneto on base and remove magneto. Remove hex nut securing cam member to magneto shaft. Remove flat washer and lock washer from shaft. Separate cam from shell, using tip of screw driver blade between shell

Starter
Showing the various parts lettered to simplify the replacement of a spring should same be necessary. The spring ends engage with a notch in shell and slot in hub of cammember.

The Lauraine Rigid Type Impulse



and cam. Pull cam member forward and out. Remove flange member or separator which is employed to prevent spring from interfering with the operation of the inside catch.

To insert new spring, slip flange separator over hub of cam and insert inside hook of spring in slot of cam member. Insert cam with spring in shell with outer hook of spring in a position to engage with notch in shell. Give the cam a quarter of a turn which will lock the outer hook of spring in the notch of the shell. Press home the cam.

Replace lock washer on armature shaft, next the flat washer and last the nut, tightening the last named. Replace magneto and re-time it in the conventional manner.

Note.—Use can be made of the impulse

starter to rotate the armature shaft until the proper relation between the driving and driven couplings is obtained as the impulse starter will be practically a solid coupling as previously explained.

Lubrication and Care

The Lauraine impulse starter requires but little attention and an occasional lubrication of the gravity latch. See that the latch works freely on its stud, and that the centrifugally operated and inside catch latch also work freely.

One of the features of the Lauraine impulse starter is the use of a steel shaft cast integral with the driving end plate of the armature. This provides a solid construction and avoids the possibility of shocks loosening shaft from end plate.

A Few Kicks Registered by Dealers

Says Sub Dealers Are Impractical

There is a dealer in Manchester, N. H., who has at the head of his truck department a man who has made an intensive study of merchandising trucks in isolated territories. This executive travels extensively in his territory and, incidentally sells tractors as the writer learned later, when he met him at a tractor demonstration at Milford, N. H., quite a distance from Manchester. It is interesting to note that the tractor was transported to the scene of the tractor demonstrations by a truck and that the use of trucks on the farm was also preached. In talking with this man he stated that he had not, as a rule, found the sub dealer plan practical in selling trucks in his territory, because they generally take on or represent several makes. "This is done in order to obtain the commissions for they do not carry a truck in stock unless one is assigned them for show room purposes or for display. Whenever they dig up a prospect they send an SOS call to me and I either have to go out or send a man

to close the sale-and the sub agent grabs off the commission. That is all he is interested in. Some of these birds expect you to dig out the leads and sell them. They cannot or will not try to analyze the prospect's business and when you attempt to point out the need of it they come back with the reply that they cannot afford to hire a capable salesman. In my opinion much of the trouble of this kind could be avoided to a large extent if distributors in territory similar to ours would confine their efforts to a smaller territory. There is too much of this grabbing off big territory. What should be done is to direct effort towards concentrating on a small territory. Another necessity is the development of real salesmen. We need some form of a training school where raw material can be whipped into shape, taught motor highway transportation on a sound basis. Until this is done and service given the attention it deserves, trucks are not going to remain sold in New Hampshire. As to the possibilities, why, there is a great future for trucks in our state. More were sold in 1918 than during the previous five years."

Too Many Changes, Says Dealer

A dealer in New Hampshire has a grievance against the company he represents. He claims that the engineering department makes too many changes in a model after production has begun. This dealer says that this works to a disadvantage as it not only means carrying a larger stock of parts than should be necessary but results in much confusion when customers and the small dealers order parts from him. He cited one instance of where five different changes had been made in a certain unit. "As a result of this policy my stock room man has to guess which is which when he receives an order for that part, and it is not infrequent that the part is returned with express charges collect and a letter stating we sent the wrong part, that it does not fit, and some even add a postscript suggesting that we take a course in mechanics in some correspondence school."

Service Station and Repair Shop Appliances

Equipment for the Ford Service Station

Several excellent labor saving devices especially suitable for the handling of repairs in Ford service stations, are be-



Connecting Rod Aligning Jig
Showing the Ford piston and rod properly
assembled in this jig

ing produced by Brodrib Bros. Auto Co., 59 Congress St., Hartford, Conn. In addition to the service station items, the Brodrib line includes a special lightweight piston for Fords. This accurately machined and ground piston is of gray iron. Three lap-joint rings and a hardened and ground wrist pin constitute part of its assembly. It is claimed to weigh a pound less than the standard Ford piston and sells at \$3.



Brodrib Piston
It is of grey iron
and has three lock
joint rings

The engine stand consists of two main parts, the base which is attached to the work bench and the arm which is attached to the engine block. The feature of this stand is the fact that the engine block can be secured and positioned on the extending arm prior to its removal from the chassis. A performance that not only involves but one operation but also eliminates much of the physical effort often required with the more conventional designs of engine stands. The stationary member is bolted to the work



Towing Axle for Use in the Event of a Broken Axle

bench with three ½-in. bolts. The engine block can be retained in four positions, top, bottom or on either ends, affording access from all angles. When the engine stand is revolved, the flywheel will not strike the bench. The price is \$16, with a discount to dealers.

The connecting rod piston aligning jig is designed to enable the accurate aligning of the piston and rod square with the crankshaft. This jig, complete with the squares, sells for \$16.

The towing axle can be quickly attached no matter how adverse the con-



Engine Stand With the Block Retained
The member of the stand which attaches to the
block can be applied before the block
is removed from the chassis

ditions or where the axle may be broken. The truck is jacked up and roller bearing removed with the grease cup. The turned journal of the towing axle is put in place of the roller bearing and locked fast with a cap screw through the grease cup hole. The original rear wheel is put on and truck can then be towed. Price is \$8.

New Adjustable Staff Wrench

A new tool recently introduced to the trade by the Romaro Machine & Tool Company, Inc., 682 Broadway, N. Y., and known as the staff wrench, said to greatly facilitate nut work, as it will accommodate sizes ranging from ½ to 2¾ in. of both the hexagon and square nut variety.



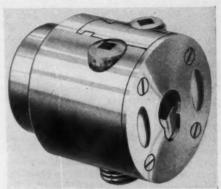
This wrench will handle nuts 34 to 34 inch hexagon or square, and is made of carbon steel, drop forged

The length of this wrench is 10½ in. and the maximum width of the jaw is 2¾ in. It is made of carbon steel, dropforged throughout, except for the handle which is drawn steel. This wrench is quickly set and can be readily jaw-locked in any position desired by manipulating the knurled locking nut.

This wrench sells for \$4.50, which selling is taken care of by the Staff Bros. Co., 1765 Broadway, New York.

The Casler Drill Chuck Boring Head

The Casler Drill Chuck Boring Head manufactured by the Marvin and Casler Co., Canastota, N. Y., is featured by two



A Strong Boring Head For undercutting and recessing work on lathe

screws, one grips the drill and the other, which is graduated to .001 in., controls the offset. This device can be equipped with a taper shank and mounted on a milling machine for drilling and reaming and boring. It is especially serviceable for undercutting and recessing when mounted in a turret lathe. This tool is furnished with any style shank.

Brief specifications are: Diameter of body, 3 in.; length of body, 33% in.; capacity of drills, 0 to 34 in.; capacity or boring tools 34 to 9-16 in.; offset, 3% to 3/2 in.

New Electric Cell Test Instrument

The new Springfield High-Rate Discharge Instrument, introduced by the John O. Heinze Co., Springfield, Ohio, consists of a high-grade voltmeter with center reading 2-0-2, graduated in tenths. The voltmeter is mounted on two steel posts and a convenient handle is provided. The current is short-circuited through a fixed resistance which determines the rate of discharge. If the needle of the device rests between the graduations 1.3 to 1.7 volts it may positively be assumed that a cell is in good condition.. A cell having defective insulation is indicated by a recession of the needle; if the circuit is broken in any manner, the needle will remain inert at zero. From the registrations of this device the comparative strength of the cells may be obtained, an important factor in determining the general condition of the battery. The regular list price of this instrument is \$15.



Defective Battery Cell Detecter

Grebford Rear Axle Press

The Greb Manufacturing Company, 173 State Street, Boston, has augmented its line by the Grebford rear axle press, the No. 12, Junior. It is designed for removing and pressing on axle shaft gears without imposing any bending stress on the shafts and can be used on axles up to 11/4 in. in diameter and gears up to 61/2 in. The press is equally useful for removing the drive shaft pinions. It can be employed for a number of operations such as removing connecting rod, wristpin, timing gears, front axle spindle body bushings, etc., and can be employed for straightening rods. By pushing a plate to one side a solid base is obtained for the axle to rest on, and by pushing the plate in the opposite direction, the hole centers with the hollow shaft allowing the axle to pass through the base. One of the features of the press is that it may be secured in an upright position or laid down horizontally by means of a hinge. In the last named position the press can be utilized on work of any length. The construction is steel throughout and very sturdy. It is 36 in high, its shipping weight is 50 lbs., and lists at \$30.



Showing One of the Grebford Line of Presses

The company also exhibited its No. 10 press of 20-ton capacity and designed for service station work on passenger cars and light trucks. It is of steel, sturdily constructed and has a ratchet wheel with large ball thrust bearing to eliminate friction. The ratchet can be operated in either direction. The wheel is placed between two heavy steel castings, the upper being the same shape as the frame and riveted to it. Two triangular steel plates reinforce the frame at this point. The press is designed for operation in a small space and hinges on the base permit of laying on the floor for long work. Their bars are quickly interchangeable by sliding them between the bolts. The screw does not turn, and the base, upper cross members and top plates are riveted. The maximum adjustment between screw and extreme bottom is 48 in. The screw is 26 in. long and 11/2 in. diameter. The wheel is 12 in. in diameter, and a 30 x 7/8-in. bar is supplied for operating the wheel where more than hand pressure is required. The sliding bars are steel, 32 x 4 x 1/2 in. Two 4-in. channel parallel bars, 12 in. long, and one U-iron are supplied. The shipping weight is 250 lbs. The price is \$100 f.o.b. factory.

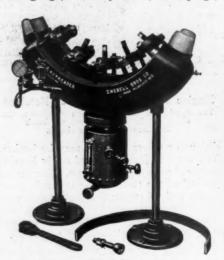
The Greb arbor press is designed to be used with the three long jaws of the No. 1 puller made by the company, and comes

complete with two V-blocks and one V-cap. It is useful for pressing off gears, bushings, bending pipes, straightening shafts, etc. It makes a good bench plate. The width is 14 in., depth 2 and the diameter of the center opening is $3\frac{1}{8}$ in. The weight, approximately, is 69 lbs. The list price is \$12.50.

The Greb bearing and race attachment, used with the No. 2 puller, has a knife edge and can be forced between magneto, generator and engine starter bearings and races where use of the ordinary puller is not practical. The attachment can also be used back of small gears, and bearings. The device has a bearing and race capacity up to and including 2 in. The list price is \$4.

Zwebell Retreader

A new Model G Retreader made by the Zwebell Bros. Co., 482 Milwaukee St., Milwaukee, Wis., has been recently added to this line. The shell of the small, though strong boiler is ¼-in. thick and the crown sheet is 5-16-in. and contains six 1-in. tubes. This outfit has all the necessary fittings such as fuse plug, water gauge, three try cocks, flush plugs,



This New Zwebell Retreader Recently Introduced by the Zwebell Bros. Co., is Equipped for Either Gas or Gasoline Burning.

drain cocks, steam gauge, pop valve, etc. The type of burner to be used is optional, being either gas or gasoline. A woven fabric bag, spring bar, socket and ratchet wrench are supplied with these outfits.

Steiner Hydrokit

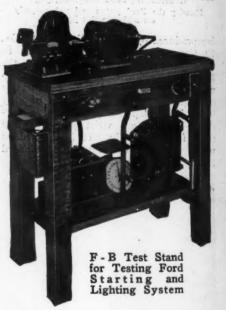
A new form of Steiner Hydrokit recently offered to the trade by the Steiner Mfg. Co., Long Island City, N. Y., is an outfit especially adaptable for storage battery service station work.

The container holds approximately a gallon. The bulb construction combines a water-tight feature, making it impossible for liquid to spill. The jar is white glass, equipped with a heavy rubber base, to reduce the danger of breaking if brought carelessly in contact with a hard surface. Convenient carrying is afforded by the provision of a handle on the jar.

F-B Electrical Test Stand

The F-B Test Stand, with its full equipment for testing the F-A starting and lighting equipment used on the Ford car, is being manufactured by the F-B Electric & Mfg. Co., Detroit, Mich., distribution being handled by the Fairbanks Co., Broome and Lafayette Sts., New York City. This test stand will make a thorough and complete test of the F-A generator and F-A motor, and will locate and assist in repairing any troubles or defects. The "cutting in speed" is shown; the regulation and high speed also.

The stand proper is made of seasoned and dried hard wood. Provision has been made for the shelving of the battery, scale and other equipment and a drawer for special tools. A universal motor is bolted to the top of the stand. It operates from any 110-volt lighting circuit, D. C. or A. C. The speed of this motor is controlled by means of a Ward-Leonard rheostat mounted on the front of the stand, the speed being shown by the Jones tachometer. A fuse block is provided and by a toggle switch on the front of the stand, connection can be made



to any lamp socket. The generator stand is bolted to the top of the table in line with the universal motor. A toggle joint retains the generator in place, the motor being driven by a flexible coupling. A Ward-Leonard cutout is mounted between the motor and generator bracket. The F-A starting motor is retained on the generator stand when it is to be tested and a brake arm is attached to the motor shaft by a thumb screw and will readily show the torque of the motor on the scale, held by the swinging bracket. Electrical connections are made by the leads furnished. The starting switch, the same as used in the F-A system, is mounted on the front edge of this test stand. An Exide battery, 13 plates per cell, capacity 80 amp. hours, is included in the outfit, the same as with the car. The indicator is located in the top of the stand and flashes red when using it with the test points, indicating grounds or shorts. The price is \$350.

Replacement Table. Corrected Monthly

Including Piston Ring Sizes, Carburetor Sizes, Brake Lining Sizes and Truck Frame Dimensions

Note: Under Carburetor Inlet Diameter will be found either the size of the main air intake or the gasoline fuel line

			THE COMMERCIAL CAR JOURNAL 67
FRAME	Width	Over All	88888888888888888888888888888888888888
FR/	Length	Back of Driver's Seat	100 100 100 100 100 100 100 100 100 100
		No. of Pieces	**************************************
	Emergency	Тріскпевв	为何何许非非非所以何何非非非非非非非非非非非非非非非非非非非非非非所以以为其非非非非所以以为非非非非非非非非非非
NG	mer	Width	HILIOHINGGGGGGGGGGGGGGG II-DOGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
INI	Ø	Гепетр	### ### ##############################
BRAKE LINING		No. of Pieces	444030304444030000444040440404040404040
BRA	901	Тріскпева	作作作作作作者在在在在在在在在在在在在在在在在在在在在在在在在在在在在在在在在
	Service	Width	SSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS
		Length	
	retor	Inlet Diameter	**************************************
ENGINE	Carburetor	Outlet Diameter	A AN AN AN AN AND AND AND AND AND AND AN
EN	Piston Rings	Width	· 为为事,为事事事事。 为事事事事事事事。 为为为事事事为及为为, 为为事事事事事事事事。
	Pis Ri	No. per Cyl.	$\vdots \qquad \vdots \qquad$
	1	Name, Model and Tonnage	Collier 18-1. Collier 20-2. Collimbia F-1. Columbia G-1. Columbia F-1. Connecte E I 1135. Connecte E I 135. Connecte I 135. Connecte I 135. Connecte I 135.
FRAME	Width	Over All	\$
FR/	Length	Back of Driver's Seat	11111111111111111111111111111111111111
		No. of Pieces	このこことはそれなるないままままままままままままままままままままることにこれのこのこのことをもをもまままままままままままままままままままままままままままままままままま
	Emergency	Thickness	大大大大大大大大大大大大大大大大大大大大大大大大大大大大大大大大大大大
NG		Width	因为只有自己的自己的自己自己的自己的自己的自己的自己的自己的自己自己的自己的自己的自己的
LIN	E	Length	80202
BRAKE LINING	FF	No. of Pieces	00000000000000000000000000000000000000
BR	rice	Тһіскпевв	大大大大大大大小中中中中中中中中中中中中中中中中中中中中中中中中中中大大大大大大
	Service	Width	ದರರು ದೂರು ದರು ದರು ದರು ದರು ದರು ದರು ದರು ದರು ದರು ದ
		Length	11110000010101010101010101010101010101
	retor	Inlet Diameter	THE THE THE THE PROPERTY OF THE
ENGINE	Carburetor	Outlet Diameter	######################################
EN	Piston Rings	Width	早年年年 教育年年 华安敦美
	Pi	No. per Cyl.	4 4 6
		Name, Model and Tonnage	Acason R. 1. 18-11/2 Acason R. 18-11/2 Beck-Hawkeye B-11/2 Acason R. 18-11/2 Beck-Hawkeye D-3. Beck-Hawkeye D-3. Beck-Hawkeye D-11/2 Beck-Hawke

Replacement Table—Continued

	9	ENGINE		1	-	BRAKE	LINING	NC		T	FRAME	ME	
	Piston Rings	Carburetor	retor		Service		-	Emergency	eney		Length	Width	
Name, Model and Tonnage	No. per cyl. Width	Outlet Diameter	Inlet Diameter	Length	Мідер	Thickness No. of Pieces	Length	Мідер	Тріскаев	No. of Pieces	Back of Driver's Seat	IIA 19VO	Name, Model and Tonnage
Douglas 114. Douglas 214. Dupler E-3/4 Bagel 100-2 Ellsworth 22A-1/4 Ellsworth 22A-1/4 Ellsworth 22A-1/4 Erageol 214. Fargeol 214. Federal WD-2. Federal WD-2. Federal WD-3. Federal Havy Duty. Federal Havy Duty. Federal Havy Duty. Federal Havy Duty. Ford T. Ford T. Ford T. Garford 77C. Garf	xxx xxxxxxxxxx xx xxxxxxxxx xxxxxxxx xx xxxx	XXX X 4-4-22 XXXXXXXXXXXX XXXX XXXXX XXXX+4-4-1	ANAMARANA PARAMANA PA	222-232-24-2522-24-252-24-24-252-25-25-25-25-25-25-25-25-25-25-25-25		在我们就作作就活作的现在分词有效的就是我们就是我们就是我们就是这个人的意思是是这个人的,你们还是这个人的意思的是是自己的证明了!——只有在在在在在中间,我也是这里的自己的证明的问题的问题,我们可以可以可以可以可以可以可以可以可以可以可以可以可以可以可以可以可以可以可以	######################################	addauuuuaddauuuuuuuuuuuuuuuuuuuuuuuu	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	ପ୍ରାପା । ಈ ୮ଗ୍ରାପ୍ରାପ୍ର ବେ	1220 1220	######################################	Hawkeye K-15. Hawkeye M-2. Hendrickson 1-255. Hendrickson 1-355. Hendrickson 1-355. Hendrickson 1-355. Hendrickson 1-355. Hendrickson 1-355. Hendrickson 1-355. Hover 204-135. Hover 204-135. Hover 204-135. Hufbart 20-135. Hufbart 20-135. Hufbart 20-135. Hurburt 23-135. Hurburt 23-135. Indiana 12-136. Indiana 12-136. Indiana 12-136. Indiana 20-2. Indiana 12-136. Indiana 20-2. Indiana 30-5. Indiana 30-5. Indiana 30-5. Indiana 30-5. Indiana 30-5. Indiana 30-8. Kalamasoo H-236. Kalamaso

FKAME	Length Width	Back of Driver's Seat Over All	44446688448888888888888888888888888888
	Len	Back of	200001112555555555555555555555555555555
1		No. of Pieces	
	ney	Тріскпевв	李智夫并有大人为人的人对对人对对人对人的人的,你们们们们们们们们们们们们们们的对对人的对对人的对价的证明,我们们们们们们们们们们们们们们们们们们们们们们们们们
ادِ	Emergency	Width	namagan-nan-ananananananananan
LINING	E	Гепетр	40110100111100111111111111111111111111
		No. of Pieces	000444-1-000-00000000000000000000000000
BKAKE	90	Тріскпевв	告诉请请证为为为为为为为为为为为为为为为证证证证证证证证证证证证证证证证证证证证
	Service	Width	annoadou-na-nadanacanananananananacacananacananan-n-nanadananananananananananan KAK K K K K K K K K K K K K K K K K K K
		Length	\$4215875518255446234824465868555568686868686868686868686868686
1	Carburetor	Inlet Diameter	tite XXXXXXX ti XX XXXXX ti XXXXXX XX**********
ENGINE		Outlet Diameter	ARREN R RAKE REFERENCE REF
EN		Мідер	
	Piston Rings	No. per cyl.	
		Name, Model and Tonnage	Hawkeye K-1½ Hawkeye M-2 Hawkeye M-2 Hawkeye M-2 Hamdrickson 1-2½ Handrickson 1-3½ Hadrickson 1-3½ Hamdrickson 1-3½ Hambur B-1½ Hughway-Knight B-5 Higrade B20-1½ Hoover 1204-1½ Hoover 1204-1½ Hufman B-1½ Hufman B-1½ Hufman C-1½ Hufman B-1½ Hufman C-1½ Hufman B-1½ Humbo B-1½ International H-2 International H-3½ International B-3½ International B-1½ International H-3½ International B-1½ International H-3½ Internati

910	Width	Over All	40000000000000000000000000000000000000
FRAMES	Length	Back of Driver's Seat	111111120 111111120 1111120 111
T		No. of Pieces	иниминици : : : : : : : : : : : : : : : : : :
LINING	ney	Thickness	李子中大大大大中中,中大大大大,中中大大大大大大大大大大大大大大大大大大大大大大
	Emergency	Width	andananana andanananana anga
	Em	Length	282218182888; 882321; 72 7 77 7 77 7 7 7 7 7 7 7 7 7 7 7 7 7
	e	No. of Pieces	
		Трісказв	
	Service	Width	स्वराह्मत स्वतंत्र स्वतंत्रत स्वतंत्रत्वात्त्वः स्वतंत्रत्व सः स्वतंत्रत्व स्वतं सः स्वतः स्वतः स्वतः स्वतः स्
	ν <u>α</u>	rength	40848409674404090806660000000000000000000000000000
 	or	Diameter	
	Carburetor	Inlet	THE THE THE TAX THE TA
	Carl	Outlet Diameter	MANARA MANARA E ANTARA PERSENSIAN SOCIETATION SERVICES
	Piston Rings	Width	为证证或证证证证证证证证证证证证证证证证证证证证证证证证证证证证证证证证证证
1	P.	No. per Cyl.	$\vdots \\$
		Name, Model and Tonnage	Northway B3-3½ O. K1½ O. K1½ O. K1½ O. Helkoyy W-1 Old Reliable A-1½ Old Reliable B-2½ Old Reliable C-3½ Old Reliable C-3½ Old Reliable E-1½ Old Reliable E-1½ Old Reliable E-1½ Oneida B 9-1½ Packard 1½ Republic 10-1 Republic 10-1 Republic 10-1 Republic 20-3½ Republic 10-1 Republi
FRAME			
	Width	Over All	
	Length Width	Back of Driver's Seat IIA 1990	4%
	Length	Driver's Seat	11111111111111111111111111111111111111
	Length	Back of Driver's Seat	
	Length	No. of Pieces Back of Driver's Seat	######################################
		Thickness No. of Pieces Back of Driver's Seat	######################################
	Length	No. of Pieces Length Width Thickness No. of Pieces Driver's Seat	100 100
	Emergency Length	Length Width Thiokness No. of Pieces Back of Driver's Seat	
	Length	No. of Pieces Length Width Thickness No. of Pieces Driver's Seat	######################################
	Service Emergency Length	Length Width Thickness No. of Pieces Width Width Thickness Thickness Thickness Seat	######################################
Charles Carrier	Service Emergency Length	Width Thickness No. of Pieces Length Width Thickness No. of Pieces Back of Driver's Seat	######################################
During Chair	Emergency Length	Diameter Length Width Thickness No. of Pieces Thickness No. of Pieces Thickness Width Thickness Seat Seat	######################################
BRARE LINING	Carburetor Service Emergency Length	Outlet Diameter Inlet Diameter Length Width Thickness No. of Pieces Thickness No. of Pieces Thickness Width Width Width Seek of Pieces	######################################
ENGINE BRAKE LINING FRAME	Service Emergency Length	Outlet Diameter Inlet Diameter Length Width Thickness No. of Pieces Thickness No. of Pieces Thickness Width Width Width Seek of Pieces	######################################

Replacement Table—Continued

LINING FRAN	Emergency Length Width	No. of Pieces Length Width Thickness No. of Pieces Back of Driver's Seat.	11111111111111111111111111111111111111
BRAKE	Service	Length Width Thickness	8000 1886 600 60 1886 600 60 1886 1886 1
ENGINE	Rings Carburetor	Width Outlet Diameter Inlet Diameter	**************************************
j i		Name, Mode and Tonnage No. per Cyl.	Schaolt 234 Schaolt 234 Schaolt 345 Schaolt 354 Schaolt 354 Schaol 354 Schaol 354 Schaol 364 Schaol

		ENGINE	NE				BRAKE		LINING	١		T	FRAME	ME
	Piston Rings		Carburetor	tor		Service	90		E	Emergency	ney		Length	Width
Name, Model and Tonnage	No. per cyl.	Width	Diameter	Diameter	Length	цэрім	Трісклезв	No. of Pieces	Гепер	Width	Thickness	No. of Pieces	Back of Driver's Seat	IIA 19VO
Triumph 1 ½ Twin City A -3.3, & B-5 Twin City A -3.3, & B-5 Ultimate-2½ Ultimate-2½ Union H-2½ Union H-4 United-3½ United-3½ United-3½ United-3½ United-3½ United-1½ US.N1½ US.N1½ US.N1½ US.N3 US.S4 US.S4		OPPRESENTATION AND THE PROPERTY OF THE PROPERT	Andrewal Andre Andre Andre Andrewal And	was states and the states and	64-10/19/19/19/19/19/19/19/19/19/19/19/19/19/	. and	: 在为为中中中在大人的工作中的人们的一个一个一个一个一个一个一个一个一个一个一个一个一个一个一个一个一个一个一个		: Taka Katala taka tataka matala matala ::: Ta Ka Ka Katala taka	: Manda-unun-unun-unun enanan ananan mananan	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx		888884889	

-Hoopes Brothers

-Kelsey

-Jones

-Schwartz

-Prudden

-Royer

Stn-Stanweld

Kel-Kelsey

CAS-C. A. S. Products Co.

Gem-Gemmer

B-Borg & Beck C-Cone

-Jaxon

KEY OF ABBREVIATIONS

Used in the Specifications of Commercial Cars Listed on the Pages Following

In all Specifications (Q-Own M & E-Merchant & Evans Spic-Spicer Pet-Peters F-Force Feed G-Force and Gravity -Centrifugal Pump B-Force and Splash Strm—Stromberg Shk—Shakespeare Sheb—Schebler AtK-Atwater-Kent Carburetor: B&B—Ball & Ball Mag—Magneto NE—North East POL—Prest-0-Lite W-Westinghouse Con-Connecticut G-Gray & Davis -Leece-Neville Aul.—Auto-Lite Bat—Battery Flch-Flechter John-Johnson N-North East Bent-Bennett Ignition System: -Eisemann Till-Tillotson Zen-Zenith Mar—Marvel Mas—Master Mill—Miller Kin-Kingston Spl-Splitdorf Engine Starter: Cart-Carter Ber-Berling Holl-Holley Ens-Ensign P-Pressure Del-Delco Eis-Eiseman L-Auto-Lite Sim-Simms -Wagner Bos-Bosch G-Gravity D-Dyneto S-Splash Aer-Aero P-Pump Fuel Feed: B-Bijur Clutch: Hink—Hinkley H-Sp—Herschell-Spillman GBS-Golden, Belknap Radiator (Make or Type); C-Centrifugal Pump Chic—Chicago EM—English-Mersick McC—McCord
May—Mayo
Per—Perfex
R-T—Rome-Turney
Spar-Spartan
Spec—Special
Spic—Spirex
Stan—Standard
C—Cellular
T—Tubular G—Gear Pump P—Water Pump T—Thermo-Syphon Cont-Continental Valve Arrangement: Idl—Ideal Jam—Jamestown Liv—Livingston Lib-Liberty
Lyco-Lycoming Wau-Waukesha Wis-Wisconsin H-Honeycomb V-Vertical Rut-Rutenber Her-Hercules Ster-Sterling Har-Harrison L-ELL-Head Can-Candler Beav-Beaver Vict-Victory T-TEE-Head Fed-Fedders Hoo-Hooven Size of Tires: Eur-Eureka GO-G. & O. I-Overhead Flex-Flexo How Cooled: Bus-Bush Lng-Long Swartz

W&L-Waterhouse & Les-E&O-Eberly & Oris AuW—Auto Wheel Bim—Bimel Cont-Continental Wau-Waukesha Wohl-Wohlrab Mer-Merrill McC--McCanna Warn-Warner Rim Equipment: Bak—Baker Det—Detroit Simp-Simplex Arc-Archibald Hink-Hinkley Mon-Monarch Gdy-Goodyear C-Centrifugal Pier—Pierce Rug—Ruggles StM-St. Mary Stn-Standard Wan-Wayne Fir-Firestone Sal-Salisbury Sta-Stanwell Del-Delaney Dup-Duplex Day-Dayton Mil-Military Lav-Lavine Det-Detroit Hay-Hayes Mut-Mutual Ross-Ross Smi-Smith W-Worm Governor: Wheels: Roy. Emp—Empire Hind—Hindley Own D—Dead, Own design W—Westinghouse Elip—Full Elliptic S-El—Semi-Elliptic %-El—%-Elliptic S&C—Semi and Cantilever S&%-Semi and %-Elliptic UM-Universal Machine UP-Universal Products %-FI—Semi-Floating %-FI—% Floating W-M-Weston-Mott Shel—Sheldon SP—Spring Perch Stan—Stan-Par US-United States Cham-Champion Torb—Torbensen GC-Garden City Ther-Thermoid Wis-Wisconsin Kal-Kajamazoo Cant-Cantilever Rock-Rockford Mar-Maremont Sals-Salisbury Per-Perfection Stan-Stan-Par Flot-Floating Shel-Sheldon Math-Mather Nat-National Row-Rowland Badg-Badger Ster-Sterling Tim-Timken Chi-Chicago Russ-Russel Hig-Higgins Tem-Temme Dit-Ditwiler Sav-Savage Mer-Merrill Det-Detroit Lah-Laher Tut-Tuthill Cel-Celfor Cl-Clark Rear Axle: Springs: G-Lee-Grant Lees MM-Mechanics Mach. Co. Munc-Muncie Plan-Planetary G-Detroit Gear & Mach U-Unit with motor UJ-Unit with jackshaft -ocation of Transmission: C—Chain E—External Spur Gear F—Friction L—Brown-Lipe M—Merchant & Evans I—Internal Gear
N—Concentric Spur
P—Spur
R—Double Reduction
S—Spiral Bevel D-Sea-Driggs-Seabury KB-Kinsler-Bennett Bld-Blood Brothers B-Li-Brown-Lipe Mech-Mechanics (Hele-Shaw) Rock-Rockford Selec-Selective Durst-Durston Warn-Warner Hart-Hartford B-Bevel Gear A-Amidships Covt-Covert Full-Fuller Flex-Flexite H-Hartford W-Warner Fransmission: Det-Detroit D—Disc E—Detlaff F—Fuller Cott-Cotta Acm-Acme Arv-Arvac U-Muncie Final Drive: -Covert W-Worm R-Rear Jniversal:

-Clark

Commercial Car Specifications—Corrected Monthly

The Specifications, Chassis Prices, Etc., Are Corrected Each Month From Data Supplied Direct by the Makers. GasolineTractor-Trucks and Electric Commercial Cars Will be Found at the End of Gasoline Commercial Cars

See Also Replacement Table in "Service and Repair Departments." Truck Frame Dimensions Are Included in Replacement Table

(Where prices are not given it is because we have been unable to get them from authoritative sources) (All New Models and Changes in Current Models Are in Heavy Type)

800 Own 2%x4 12.1 L T H B Strm G AtK Fric 3 Dead C O	1990 1010 Own 378x456 24.1 L C T B Stew V Own N D Selec 3 U Own S Flot 2120 1095 Own 3 24.2 L T H B Holl C A C GLee 3 U Stan B Gem C Gem Gem	1500 Pounds	2220 Lyoo 3½x5 19.6 L T Lv F Strm G Bos G B Det 3 10 Spic B Spic B Spic B Spic Spic B Spic	1 Ton	3876 2076 Wau 33,x54 22.6 L P Can S Sheb G Eis G F Full 3 U Bid W Timk 2876 2076 H-Sp 34,x5 22.5 L T Can B Strm V Eis G Eis E Eis Eis E Eis
2%x4 12.1 L T H B Strm G AtK Frie 3 Dead C	35%44% 24.1 L C T B Stew V Own N D Selec 3 U Own B 35%44% 15.6 L T H B H C U Q Q Q B Stan B B B C R C R C Selec R B B C R R R R R R R R R	1500 Pounds	Lyco 33x5 19.6 L T H S heb Atk R B Belee 3 U Arv B Count 3xx5 19.6 L T Liv F Strm G Bos G B D D D Arv B B C D <td< th=""><th></th><th>3% 25.6 L P Can S Sheb G Eis G Cott B Rayl V Eis G B Cott I <t< th=""></t<></th></td<>		3% 25.6 L P Can S Sheb G Eis G Cott B Rayl V Eis G B Cott I <t< th=""></t<>
2%x4 12.1 L T H B Strm G AtK Frie 3 Dead C	33%44% 24.1 L C T B Stew V Own N D Selec 3 U Own B Stan B Stem T T T B Holl G Con A G G G G B B B B G G	1500 Pounds	19 10 12 13 14 14 15 15 15 15 15 15		3%x5% 22.6 L P Can S Sheb G Eis F Full 3 U Bld W 3%x5 22.6 L T Stan Strm V Discrete Bld W Bld W W Bld W Bld W W Bld W Bld W W Bld W W Bld W W Bld W W W I W Bld W W I W W I W W I W W I I W I<
B Strm G AtK Fric 3 Dead C	24.1 L C T B Stew V Own N D Selection	1500 Pounds	19.6 L T H S Sheb Atk R B Selec 3 Arv B B B B B B B B B		22.5 L P Can S Sheb G Eis F Full 3 U Bid W Eis G Eis Can B Cat 3 U Bid W Can B Strm V Eis B Glee 3 U U D I I I I Ear S Strm V Aul Q F Full 3 U U D I I I I Ear S Strm G Bos D F Full 3 U Car I I Ear B Strm C Con F Full 3 U Arr I Ear B Strm C Con F Full 3 U Arr I Ear Ear B C Con I Ear B Ear
B Strm G AtK Fric 3 Dead C	C T B Stew V Own N D Selec 3 U Own S T T H B Holl G Con A C GLee 3 U Stan B T MoC B Zen G Atk C Selec 3 U Spic W T McC B Zen G Atk C Selec 3 U Spic W C Selec C Selec C Spic W C Selec C	1500 Pounds	T H S Sheb G Atk R B Selec 3 G Atv B C C K Shirm G Bos G B Det 3 U Shic B C C K Shirm G Bos G D Selec 3 U UM B G G G G G G G G G		P Can S Sheb G Eis F Full 3 U Bid W T Gan B Rayf V Eis G B Glee 3 U Bid W T Can P Strm V AuL Q F Full 3 U UP I T Gas R Strm G Bos D F Full 3 U UP I T G B Zen G Con F Full 3 U Arr I T C B Strm G Con Full 3 U Arr I T F B Strm G Con Full 3 U Arr I T F B Builo G Bat I C Own 3 U UM I T F B Builo G Bat I C Own 3 U UM I T F F F F F F F F F
AtK Fric 3 Dead C	B Stew V Own N D Selec 3 U Own B Stew V Con A C GLee 3 U Stan B B Hall G Atk C Selec 3 U Spic W SC B Zen G Atk C Selec 3 U Spic W C B Zen G Atk C Selec 3 U Spic W C B Zen G Atk C Selec Sel	1500 Pounds	Secondary Seco		Sheb G Eis F Full 3 U Bld W
AtK Fric 3 Dead C	V Own N D Selec 3 U Own S Own B Own Own B Own	1500 Pounds	Colored Broke State Stat		G Eis
AtK Fric 3 Dead C	Own N D Selec 3 U Own B Own C Selec 3 U Spic W Own C Selec B Own C Own O	1500 Pounds	Atk R B Selec 3 10 Arv B Bos G B Det 3 U Spic B Bos D D D D D D D D D		Eis C F Full 3 U Bid W Eis G B Cott 3 U Bid W Eis B Cott 3 U D I Cott C Eis B C Eis B Eis Eis B Eis Eis
Fric 3 Dead C	N D Selec 3 U Stan B C C C C C C C C C	1500 Pounds	R B Selec 3 Arv B B Det 3 U Splc B Det 3 U Splc B Det Selec 3 U U D Selec 3 U U D Selec 3 U Hart U C Selec 3 U Hart U E Det B Det 3 U Hart U E Det B Det Det B Det B Det B Det B Det B Det Det B Det D		G. F Full 3 U Bid W Edge B Cott 3 U UP I Edge B Cott 3 U UP I Edge B U UP I Edge B U UP I Edge B U Ster B Edge B U Ster B Edge B U Ster B Edge B U UP I E Full 3 U Ary I Edge B U UP I E Full 3 U UW I I Edge B U UP I I UP I I UP I I I UP I I I UP I I I I
13 Dead C	1000 Pounds Selec 3 U Stan B Selec 3 U Stan B Selec 3 U Spic W Selec 3 U Spic W	1500 Pounds	Selec 3 1		Full 3 U Bid W Glee 3 U UP I Full 3 U UP I Full 3 U Ster Bid I Stele 3 U Ster Bid I Full 3 U Arr I Full 3 U Arr I Own 3 U UM I
13 Dead C	Pounds 3 U Own B 3 U Stan B 3 U Stan B 3 U Spic W Spic W	0 Pounds	3 U Arv B B B B B B B B B		3 U Bld W 3 U UPP I 3 U UPP I 3 U Ster B 3 U Are I 3 U OW I
Dead C	Own Stan B Spic W Spic W	spun	Arv Bild County Bi	uo	Bid W UP II UP II Bid I Ster B Ary I
Dead C	S wn S tran B her B W pic W	S	Mmnmm i i mmnmm x		**************************************
	0 0 0		Hess Stan Dead WM Yown Torb Timk Own Cl MC Cl Klot Klot Cl Klot Cl MW Cl MW Cl MW Cl MW Cl MW Cl MW Cl MW Cl MW Cl MW MW MW MW MW MW MW MW MW MW MW MW MW		HAPL ML '
14.25	44000		6:1. 6:1. 7:1. 7:1. 7:1. 7:1. 7:1. 7:1. 6:1. 6:1. 6:1. 6:1. 6:1. 6:1. 6:1. 6		25.25. 6.6.5.1 6.6.5.1 6.7.25. 6.7.25.
	119				1 33: 1 31: 18: 19: 2 20: 23:
15:1 Tu	69				Det Det Det
	900 Am		'4 : " at 1:		36x3/4 53xx4** 53xx4** 53xx4** 31x4** 31x4** 31x4** 31x4** 33xx4** 33xx4**
_					332x34 332x34 332x34 331x4 332x4 34x4 34x4
	** *		* **		Ross Ross Ross Lav Lav Ross
	တ်တဲ့				
92	27 27		255 20 Mon 55 Own 55 Own 58 Mon 58 Mon 66		142 Wau 130 Dup 130 Pier 130 Pier 124 Pier 113
. Pru	Kel Sal Hoo		Wan Own AuW Sch Pru Stn Wan Stn		Bim Bim Stn Hay E&O Sch
:	Own Det Fir		Fir Fir Fir Fir Fir		Str Fire
	09	4.25:1 12.25:1 Tut 28x3 28x3 Own 92 Pru 4.16:1 19.41:3 S. & % 33x4 33x4 Own 114 Kel Own 3.6:1 Own 28x324 28x324 Own 104 Det 3.6:1 Shel 31x4 2x444 C.A.S. 108 Hoo Fir Shel 32x444 2x444 C.A.S. 107 Hoo Fir Shel	4.25:1 12.25:1 Tut 28x3 28x3 Own 92 Pru	4.16:1 19.41:3 S. & % 33x4 33x4 0wn 114 Kel 0wn 4.75:1 16:1 Shel 30x3\frac{3}{2}\sqrt{8} Son3\frac{3}{2}\sqrt{8} Pos 108 Shel 30x3\frac{3}{2}\sqrt{8} Pos 108 Shel 30x3\frac{3}{2}\sqrt{8} Pos 108 Bot Det Shel 31x4 2x4\frac{3}{2}\sqrt{8} C.A.S. 108 Hoo Fir Pos 115:1 Pos 115:1 Pos 12x4\frac{3}{2}\sqrt{8} C.A.S. 127 Hoo Fir Pos 15:1 Pos 13x4 Shel Shel	4.16:1 19.41:3 S. & % 33x4 33x4 0wn 114 Kel 0wn 4.75:1 16:1 30x3)x 30x3)x Fos 108 Sal Det 30x3)x S. & 108 Sal Det S. S. S. S. S. S. S. S

		APRIL 15, 1920
	1 1 1 1 1 1 1	Stn Fir Det
	142 Wau Bim 130 Pup Bim 130 Pup Bim 130 Pup Bim 131 Pup Bim 141 Pup Bim 142 Pup Bim 142 Pup Bim 125 Pup Bim 128 Bim Bim 138 Bim	1230 Fier Pru 124 Mon Hay 124 Mon Bah 122 Mon Bin 1250 Mon Bin 132 Phar Bet 134 Phar Smi
	Ross Ross Lav Lav Lav Lav Ross Ross Own Jac Ross Ross Ross	
	23 23 24 24 25 25 25 25 25 25 25 25 25 25 25 25 25	34x5 34x6 36x6 35x5 36x4 36x4 36x4 36x4
	8 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	34x3/5 34x3 35x5 34x4/5 36x3/5 36x3/5 80x3/5 80x3/5
	Det Det Det Det NeE S-E S-E S-E S-E S-E S-E S-E Det Nes S-E Det Det Det Det Det Det Det Det Det Det	Per Shel Det Det Det Math Nath
	20.25.11 2.25.51 2.25.75.12 2.25.75.12 2.25.13	20.3:1 28.3:1 26.2:1 3.5:1 23:1 20:6:1
	8.25.1 66.5.1 7.7.5.1 8.25.1 8.25.1 7.5.1 7.7.5.1 7.7.5.1 7.7.7.5.1	7:1 8.2:1 8.2:1 5.33:1 7:1 7:1 7:2 7:2 7:2 7:2 7:2 7:2 7:2 7:2 7:2 7:2
	March Marc	
	Bld Bld Bld Bld Bld Bld Bld Arv Chr. Arv Spic Spic Blic Blic Blic Blic Bld	
Ton		בפסם: בפס
1	Full Full Full Full Full Full Full Full	
	10 10 10 10 10 10 10 10 10 10 10 10 10 1	*Armaraar
	Eise Sim Aut. Con Bos Con Bat Bos	Sim
	S C C C C C C C C C C C C C C C C C C C	Zen G Zen K
	HENNER CONTRACTOR	
	MEN	COTTTOWN CONTTOWN COTTTOWN COTTTOWN COTTTOWN COTTTOWN COTTTOWN COTTTOWN COT
	22.55 L 22.55	11111111111111111111111111111111111111
	SOURCE STATE STATES	20000000000000000000000000000000000000
	Wau Figure 19 Cont Cont Cont Cont	Contraction of Contra
	33650 3376 22870 22870 22870 22910 22910 22920 3300 2280 3300 1750 2300 1750 2320 1580 3325 3325 3325	3220 2100 3250 1925 3100 1950 2750
	an A keye A L L S2X	A 10
1 Ton	A cason B. A cason B. All-American All-American All-American Beak Hawkeye Belmont A. Bessemer G. Britch I. Brisch II. Brisch II. Capitol B. Combrode II. Collier IS. Collier IS. Commerce E. Commerce E. Commerce E.	Dart H. Day-Elder Denby 12. Diehl A. Dougles C. Famous B. Federal SD Ford T.

APRIL 15, 1920	ENCIAL CAN	JOORIVAL
25	60. 758	25. 55. 55. 55. 55. 55. 55. 55. 55. 55.
G G G F F F F F F F F F F F F F F F F F	Fir	Gdy San Gdy Gdy San San Gdy San
Wan Str Bim Bim Wan Str Bim Hay	Bim Pru Wan Hay	Bim Sch Are Sch Weh Hoo Hoo Bim Pru Bim Pru Bim Pru Bim Pru Bim Pru Bim Pru Bim Pru Jon Own
120 Pier 120 Pier 120 Pier 140 Pier 140 Pier 120 Pier 120 Pier 130 Pier 130 Pier 130 Pier 130 Pier 125	135 Mon 134 Wau 135 Pier 135 Own 115	142 Wass 144 Pier 140 Mon 140 Mon 141 Pier 144 Pier 158 Pier 158 Pier 164 Simp 146 Own 146 Own 148 Mon 158 Mon
Hosse Lav Lav Lav CAS Ross Ross Ross Ross Ross Ross Ross Ros	Ross W Jac Own Gem	Ross Ross Lave Com Com Lave Lave Ross Ross Ross Ross Ross Ross Ross Ros
3.86x4 3.36xx5 3.36xx5 3.86xx5 3.86xx5 3.86xx5 3.86xx5 3.86xx5 3.86xx4 3.86xx5 3.86xx4 3.86xx4 3.86xx5 3.86xx4 3.86xx5	36x4 34x5 34x4 34x5 34x5 36x5 35x5*	200 200 200 200 200 200 200 200 200 200
38423144 38423144 38423144 38423144 38423144 3842344 3842344 3842344 3842344 3842344 3842344 3842344 3842344 384234 38424 38423 38423	34x3 ½ 34x3 ½ 34x4 ½ 34x3 36x3 ½ 35x5 *	888 998 998 998 998 998 998 998 998 998
Math Per Per Per Per Per Per Per Per Per Pe	Per S-El Math Math Math Det	Det Mach Mach Mach Mach Mach Mach Mach Mach
21 6:1 122 75:1 18 6:1 18 6:1 18 6:1 23 4:1 23 6:1 23 6:1 23 6:1 23 6:1 23 6:1 23 6:1 23 7:1 23 6:1 23 6:1 23 7:1 23 6:1 23 7:1 23 6:1 23 7:1 23 7:1 25 8:1 26 8:1 27 8:1 28 8	24:1 18:3:1 24:1 23:1 18:1	20.11 20.21
7.7.21 8.8.25 8.25 8.25 8.25 8.25 9.25 6.21 7.75 7.	7.5:1 7.75:1 6:1 6:2:1	17.15.11 17.15.11
Shell Kass	Timk Nan-Torb Own Cl	Timk Timk Timk Timk Wis Mis Mis Mis Mis Mis Mis Mis Mis Mis M
\$\$\$\$\$0\$~~=\$\$\$~~\$\$\$\$\$\$\$~\$\$\$\$\$\$	≥≥===================================	**************************************
Bald Splic S	Spic Spic Spic Own	Bid Spice Sp
090 0000 000 00 00 00 00 00 00 00 00 00	A TOUDDD	□ □ □ □ □ □ □
BB-Li Selection of the state of	Selec Selec Warn MM Own Full	Fruil Pull Cott Cott Cott Cott Cott Cott Cott Co
OCC: ###D################################	Z	DOMES REMEDE: METONE LEFTERDENES
Ensemble State of the state of	Spl Eis Mag NE	Eis Aut Karaman Karama
000>>>000000000000000000000000000000000	<u>00>0 :0</u>	000-00 0 000 0000 00000 00000 00000 00000
Mass Sheb Stran St	Strm Strm Strm Zen Strm	Skray
SOURCE STREET BEEN STREET STRE	T T Spar S Spar S N T S Spar S S Spar S S S S S S S S S S S S S S S S S S S	CCONC BROWN
0-0-0-0-0-0-0-0-0-0-0-0-0-0-0-0-0-0-0-	000H0H	######################################
	22.5 L 22.5 L 24.1 L 19.6 L 22.5 L	1111. LTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTT
TAN	22222222222222222222222222222222222222	20000044000000400000000000000000000000
Court Court (Court (Cou	Buda 3 Own 3 Own 3 Own 3 H-Sp 3 Her	Banda
2425 O C C C C C C C C C C C C C C C C C C	2090 B 2425 O 11875 O 11985 H 2150 O 1600 H	22255 O B C 22255 O C 2225 O C 222
22000 22000	3900 4000 2950 3300 2500	33.00 33.00 33.00 33.00 33.00 33.00 33.00 33.00 33.00 33.00 33.00 33.00 33.00 33.00 33.00 33.00 33.00 40
Gary F. Gary F. Gland 16. Halm 14. Halm 14. Halm 14. Hoover 16B. Hoover 16B. Hoover 16B. Hoover 16B. Indepen't F. Yingt'n O. International H. Internati	Ton na 12. In Delivery. Iele A.	Anson RB. Anson RB. Anson RB. Anson RB. Antrebury TR. Available H135 Bell E. Belle E. Belle E. Belle E. Benont B. Benever H2. Benever H2. Benever H2. Benever H2. Benever H2. Benever H2. Coller 19. C
Gary F Gland J Higher Hower Indepen Indepen Indepen Internationes Keyston Keyston Keyston Koble A Menom Voble A Noble	11/4 Ton Garford 25 Indiana 12 Kissel Deliver Koehler C. Oneida A9.	A construction of the cons
	-	

	13, 1920
Pr. Cent of Weight on Rear Wheels	80 80 80 80 80 80 80 80 80 80
Rim Equipment	Fire Fire Fire Fire Fire Fire Fire Fire
Wheels—Make	Bin
Governor	Mon Mon Mon Mon Mon Mon Mon Mon
Wheelbase	1133 1133 1133 1133 1133 1133 1134 1136 1136
Reed Buirests	Lav Ross Ross Ross Ross Ross Ross Ross Ros
Rear Tires	36x6 34x5 34x5 34x5 34x5 34x5 34x5 34x5 34x5 34x5 34x5 36x5 36x6 36x6 36x6 36x6 36x6 36x6 36x6 36x6 36x6 36x5 36x5 36x5 36x5 36x5 36x5 36x6
Front Tires	355 35 35 35 35 35 35 35 35 35 35 35 35
Springs	Sher Sher
Total Gear Re- wod ni noitsub	28:11 28:11 28:16:1 23:4:1 23:4:1 23:4:1 23:4:1 24:1 24:1 24:1 25:4:1 25:4:1 26:1 27:1 28:1 28:1 28:1 28:1 28:1 28:1 28:1 28
-9H 189D IstoT dgiH ai aoiteub	7.12 7.12 7.12 7.12 7.13 7.13 7.14 8.65 1.14 8.74 1.14 1.14 1.14 1.14 1.14 1.14 1.14 1
Rear Azle	Torb Think Thi
Final Drive	######################################
Universal	Hart Hart Hart Hart Hart Hart Hart Hart
Location of noiseion Transmission	D4DD : D4DD : D4D4 : 44D4DDDDDDDDDDDDDD
Speeds Forward	ω
поівві швпятТ	Pall Print Print Pall
Clutch	のよりローでは、それのは、これには、これには、これには、これには、これには、一人には、一人には、一人には、「」、「」、「」、「」、「」、「」、「」、「」、「」、「」、「」、「」、「」、
Engine Starter	G : MM : :7 :0XU ;8 : : : : : : : : : : : : : : : : : :
Lenition System	NNE Spires Spire
Fuel Feed	0<0<40! <0: 0: 0<000<6: 0000000! 0000<6<4 < <00000000000000 <0000< <00000 0
Lubrication Carburetor	Strm Strm Strm Strm Strm Strm Strm Strm
Make or Type	WHEN WAY AND THOU HOURS AND THE SAME AND THE SAME OF T
Radiator	The design of th
Valve Arrange't How Cooled	+ + + + + + + + + + + + + + + + + + +
Horsepower	11111111111111111111111111111111111111
Bore and Stroke	8000004404000040000000000000000040040040
Engine 4 Cyl. unless otherwise noted	Cont Salar S
Chassis Price	22250 22360 22
Chassis Weight	
Model	2 Ton—Continued 1990

	4.00	1020
ADDII	15	1970

THE COMMERCIAL CAR JOURNAL

75

27.00 7.00 7.00 7.00 7.00 7.00 7.00 7.00	25
Fir	SARE FIRE FIRE FIRE FIRE FIRE FIRE FIRE FI
Own Own Are Hay	Smi Hoo Own Class Bin Sim
Pier O	Non
135 P1 140 P1 132 :- 132 :- 140 P	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Own Lav Lav Ross Gem	Ross
36x5 36x5 34x5 32x4 36x4 34x5	308.77 308.74 308.74 308.74 308.74 308.74 308.77
36x4 36x3 ½ 34x3 ½ 36x3 ½ 36x3 ½ 34x3 ½	28.00
Por Har Har Har Tut	Det Chart Math Math Math Math Math Math Math Mat
39.9:1	28.3.2.1 29.1.1 29.5.1.1 29.5.1.1 29.5.1.1 29.5.1.1 29.6.1.1 28.1.1 28.1.1 28.1.1 28.1.1 28.1.1 28.1.1 39.1 39
8.25:1 6:1 7:1 8.2:1	88.351 88.351 88.351 88.351 8.651 9.561 9.251
Timk Timk Russ	Timk Russ Russ Russ Russ Russ Russ Russ Rus
38	BEEN 18 18 18 18 18 18 18 18 18 18 18 18 18
Own Arv Spic UP	Bidd Bidd Bidd Bidd Bidd Bidd Bidd Bidd
	DAADD DDDA ADA ADA ADA ADA DDDAAADDAAA
Selec Selec Selec	Programmer of the programmer o
OWEFUE	日本では「ことでは「日本は日本では「大き」」というは、大きないはははいいははないに、大きなはない。 はいないはい はいない はいない はんしょうしょうしょうしょう はんしょう しょうしゅう しゅうしゅう しゅう
∴ ≤≤: :	Series and the series of the s
▼ 電荷電点 ▼	SERGENT STATES OF SERGENCE OF
Mar Strm Strm Strm Zen Strm Strm	Skrm Skrm Skrm Skrm Skrm Skrm Skrm Skrm
SECORE S	HE HERELEVEL WOLL WOLLT WENTER WOODEN: WORNERS WHEN WOODEN THE WOLLT WOLLD WOLLT WOLLD WOl
F0440H	OCOHOLINATE COCOCOCOCOCOCOCOCOCOCOCOCOCOCOCOCOCOCO
222.5 L 222.5 L 222.5 L 222.5 L 222.5 L	L. LL LL<
33 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	44444 : 44444
Cont Cont Cont	wwn 22 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
2325 2325 2675 2000	8875 8775
4600 3800 3700 4100 3550 3400	84450 83690 84500 84
Wilcox B. Winther B. Winther 39. Winther 430. Witt-Will N.	v v v v v v v v v v v v v v v v v v v
*****	N 4440000000000000000000000000000000000

0	
Pr. Cent of Weight on Rear Wheels	
Rim Equipment	
Wheels-Make	
Сотегор	
Wheelbase	
Steering Gear	
Rear Tires	
Front Tires	
Sgnings	
Total Gear Re- wod ai goitoub	
Total Gear Re- dgiH ai aoiteub	
Rear Azle	
Final Drive	7
[astevinU	luni
Location of Tansmission	1
Speeds Forward	2
doissimsaerT	no.
Clutch	- 6
Engine Starter	
Ignition System	
Fuel Feed	
Carburetor	
Lubrication	
Radiator Make or Type	
How Cooled	
J'agnatif evlaV	
Ногаеромет	
Bore and Stroke	
Engine—4 Cyl. unless otherwise noted	
Chassis Price	
Chassis Weight	3
Model	Confin

	THE CO	ON
	70 71 71 71 71 71 71 71 71 71 71 71 71 71	
	Gdy Gdy Brir Brir Brir Brir Brir Brir Brir Bri	
	Sth Beh Hay Wan Own Wan Wan Sch Roy Roy Stn Smi Smi	
	144 Dup 145 Pier 132 Pier 165 Pier 165 Pier 165 Pier 145 Pier 145 Pier 144 Pier 142 Dup 168 Pier 144 Pier 168 Dup 168 Dup 168 Dup 168 Pier 144 Pier 157 Pier 144 Pier 145 Pier 145 Pier 144 Pier 144 Pier 145 Pier 144 Pier 144 Pier 145	
	Ross Ross Ross Ross Ross Ross Ross Ross	
	36×7 36×7 36×8 39×8 34×6 34×7 36×6 36×7 36×6 36×6 36×6 36×6 36×6 36	
	36x4 36x4 34x4 34x4 34x4 36x4 36x4 36x4	
	Nat Row Row Det Det Det Det Shell Sh	
	36.49:1 37.26:1 37.26:1 27:1 28:1 28:21 28:21 28:4 8:1 140:1 1 38:9:1 38:9:1	
	9.111 9.2611 7.771 7.7511 9.1 8.2.1 8.2.1 8.1 7.7511 7.7511	
	Torb Timk Timk Timk Timk Timk Timk Torb Russ Russ Shel	
ned	WIND STATE OF THE	
-Continued	Flex Hart Spic Spic Spic Spic Spic Spic Spic Spic	
ပိ	6000000000000000000000000000000000000	•
Lou	B-LI B-LI B-LI B-LI Cott Cott B-LI B-LI B-LI B-LI B-LI B-LI B-LI B-LI	E
61	PRODUCE STATEMENT OF THE STATEMENT OF TH	91
	Bos Bos Eis Eis Bos Eis Eis Eis Eis Eis Eis Eis Eis Eis Ei	
	000000000000000000000000000000000000000	
	String St	
	Marcon M	
	でしているとりではいいないのである	
	The state of the	
	Buda Cont Cont Cont Sier Sier Soler Cont Buda Buda Buda Cont Cont Cont Cont Cont Cont Cont Cont	
	2890 5 5 5 5 5 5 5 5 5	
ed	6500 4000 4000 4000 4500 4500 4500 4500 4700 4400 4400 4400 4400 4400 4400 4500	
'on-Continued		
)-u	14. C. C. L. C.	
2	the Second	

	THE CO	OMN	MERCIAL CAR JOURNAL	APRIL 15, 1920
	70 70 70 70 71 72 72 73 74 74 74 74 74 74 74		Fig. 10 Fig.	
				G G G G G G G G G G G G G G G G G G G
	StM		Bin Sin in Pru	Namina Satisfactor
	1444 Dup 1142 Pier 1142 Pier 1160 Pier 1156 Pier 1156 Pier 1156 Pier 1144 Pier 1144 Pier 1144 Pier 1157 Manuel 1157 Manuel 115		156 Wau 156 Wau 156 Dub 156	170 Du 148 Pie 156 Pie 150 Pie 170 Pie 144 Pie 144 Pie 144 Pie 144 Pie 160 Du 160 Du 160 Du
	Ross Ross Ross Ross Lav Ross Ross Ross Ross Ross Ross Ross Ros		Ross Cost	Ross Ross Wohl Jac Ross Ross Ross Gem Gem Gem Ross Ross Ross Ross
	36x7 36x7 36x8 36x8 36x8 36x8 36x7 36x7 36x7 36x7 36x8 36x8 36x8 36x8 36x8 36x8 36x8 36x8		38x7 38x7 38x7 38x7 38x84 38x4 38x4 38x4 38x4 38x4 38x7	36x8 36x8 36x7 36x7 35x8 35x8 35x8 36x7 36x7 36x7 36x7 36x7
	36x4 36x4 36x4 34x4 36x4 36x4 36x4 36x4		38684 38684	36x4 36x4 36x4 36x4 36x4 36x4 36x4 36x4
	Natherland		Det Hoper Per Per Per Per Per Per Per Per Per P	Shell Ten Math
	36.49:1 37.26:1 27:1 35:1 26:1 28:2 29:68:1 24:1 8:1 40:1 38.9:1		40.37.1 34:1 34:1 34:1 34:1 34:1 33:36:1 34:1 34:1 34:1 34:1 34:1 34:1 34:1 34	39:11 4:84:11 42:8:11 22:2:11 35:11:11 37:11 37:11 36:11
	9.1:1 9.25:1 7.7:1 8.75:1 7.75:1 7.75:1 9:1 8:2:1 8:2:1 8:2:1 7.75:1 7.75:1		8.5:1 9.25:1 9.25:1 8.66:1 8.66:1 10.2:1 10.2:1 10.2:1 10.2:1 10.2:1 10.2:1 10.2:1 10.6:1 8.5:1 8.5:1 8.5:1 8.6:	9.66.1 7.75.1 9.1 8.5.1 7.4:1 10.64:1 10.63:1 7.76:1 8.92.8:1 8.76:1
	Torb Torb Timk Timk Timk Timk Timk Timk Timk Timk		Timk Timk Timk Timk Timk Timk Timk Timk	Hind Wis Shel Shel Dead Dead Timk
pa	<u> </u>		<u>BBBBBBGBBBBBBBBBBBBBBBBBBBBBBBBB</u>	\$\$\$#\$#\$O\$\$\$\$
tinued	Flex Hart Hart Hart Spic Spic Spic Ary Q Q Ary Hart Spic Ary Q Q Hart Spic Arw Own Own Own Blid Spic Spic Spic Spic Spic Spic Spic Spic		Bid Opt	Spic Acme Acme Spic Own Spic Spic
Con	### ### ##############################	=	0400004 40 04444 004444	
Lon	Own B-Li B-Li B-Li B-Li Covt Covt B-Li B-Li B-Li B-Li B-Li B-Li B-Li B-Li	Ton	CCCott Ball Ball Ball Ball Ball Ball Ball Ba	
81	В: В	$2^{1/2}$	#####################################	ZEMEROJOOH :AH
	Bose Bose Bose Bose Bose Bose Bose Bose		A A A A A A A A A A A A A A A A A A A	Bes Esser Bes Esser Bes
	00:0 >00>>00>0		\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	00000> :000000
	Sheb Strm Strm Strm Strm Strm Strm Cart Cart Strm Strm Cart Cart Strm Strm Strm Cart Strm Strm Strm Strm Strm Strm Strm St		Sheb Stran S	
*	Part Samuel Samu		THE THE PROPERTY OF THE PROPER	
	でしていているとれたすりひははくますは		040000000000 H00000 H000000000000000000	PALL CONTROL OF THE C
	1		11111111111111111111111111111111111111	28.22.28.92.17.17.28.92.
	444400 44400 40400 44 HHHHHHHHHHHHHHHHHHHH HOTOPIONOPOPOPOPOPOPOPO			4444404 444444 444444 444444 444444 444
	Buda 2890 Buda 2890 Buda 3100 Ster 2875 Cont 3150 Buda 3175 Cont 3175		Wau Buda B	O Buda Cont O Cont O Cont O Cont O Cont O Cont O Cont O Cont O Cont O Cont O Cont
-	4400 2890 2890 2890 2890 2890 2890 2890 28		4554 4560 4560 4560 4750 4750 4750 4750 4750 4750 4750 475	5600 3750 4800 3150 4800 3095 4200 2875 5700 3800 5540 3800 5540 3800 5540 3800 5540 3800 5540 3800 5540 3800 5540 3800 5540 3800 5540 3800
nue	<u> </u>		40.440.04444444444444444444444444444444	.0
Continued			1.WB - S1D.	oungst'n 2 1d K35. 1d K36.
1	P. 20 C	uc	HW TCX H22% H22% FH FH FH FH FH FH FH FH FH FH	E E E E E E E E E E E E E E E E E E E
2 Ton	Schacht. Schwarts C. Schwarts 2C. Signal J. Southern 20. Sterling 2. Superior E. Traffic. Triangle C. Triumple C. Triumple C. Triumple C. Triumple C. Triumple C. Triumple C. Wing 22. Wells C.I. White 20. White 20. White 20. Wichita M. Windira M. Windira M. Windira M. Windira M. Windira M. Witt-Will P.	2½ Te	Aces on H. Aces E. Armieder HW. Atterbury 7CX.I. Atterbury 7CX.I. Atterbury 7CX.S. Available H2½. Beell O. Beener J-2. Beeth D. Bethlehen EH Beth DZ. Collicate C. Collicate C. Collicate C. Collicate G. Dart M. Day-Eider C. Dart M. Day-Eider C. Dart M. Day-Eider C. Donal 1919. Erie 2½.	Hurburt 2 ¼ Indepen t H, Youn Kalamasoo H, Kanawa H, Karawa Kally-Springfield F, Kinbal C, Kinbal M, Koshler M, Koshler M,
			The state of the s	

88 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	70 770 770 770 770 770 770 880 851	2880 992 992 992 993 993 993 993 993 993 993
SAABE Fire Fire Fire Fire Fire Fire Fire Fire	Fig. 6	Fir Stn Stn Fir
Schin	Smi Smi Smi Smi	Smi Blim Brim Arc Arc Arc Sch Sch Jon Jon Pru Pru Pru Pru Pru Pru Pru Pru Pru Pru
Pier Pier Pier Pier Pier Pier Pier Pier	Pier Mon Dup Dup Dup Dup Dup Own Own Own Wau	Wau Dup Mon Simp Pier Pier Mon Pier Mon Pier Wau Pier Wau Pier Man Pier Mon Mon Mon Mon Mon Mon Mon Mon Mon Mon
100 100 100 100 100 100 100 100 100 100	1160 1124 1170 1152 1156 1156 1150 1175 1175 1175 1175	172 186 1986 1986 1986 170 170 170 170 170 170 170 170 170 170
Lav Ross R	Lav Ross Ross Jac Dwn Ross Ross Ross Ross Ross Ross Ross Ros	Ross Ross Ross Ross Ross Ross Ross Ross
36.x4 36.x7	36x8 36x8 36x6 40x10 40x6 36x6 36x7 36x5	40x5+ 40x5+ 40x5+ 40x5+ 40x5+ 40x5+ 40x5+ 40x5+ 36x10 36x10 40x10 36x2+ 36x2+ 36x5+ 36x5+ 36x5+ 36x5+ 40x5+
2808 2808 2808 2808 2808 2808 2808 2808	36x5 36x6 36x6 36x6 36x6 36x7 36x7 36x5 36x5 36x5 36x5 36x5 36x5 36x5 36x5	28888888888888888888888888888888888888
MASTAN SPEED OF THE SPEED OF TH	Hig Own Trut Trut Trut Trut Over Shel Shel Shel Shel	Det Det Det SP SP SP SP Math Math Math Math Math Math Math Math
38. 72:11 39. 91:13:19:11 37. 2:11 36. 88:11 36. 88:11 36. 88:11 37. 4:11 37. 5:11 37. 5:11	2:1 35.6:1 53.3:1 4.84:1 42.6:1 42.6:1 49.24:1 41.32:1	49:1 48:1 41:3:1 41
8.85:1 8.75:1 8.75:1 8.75:1 8.75:1 7.75:1 7.75:1 7.75:1 10.2:1 7.75:1 8.75:1 10.2:1 7.75:1 8.	9:1 8:9:1 10:25:1 9:1.75:1 9:1 10:6:1 7:75:1 7:75:1 7:75:1 7:75:1 7:75:1	10.33:1 12.1 12.1 12.1 12.1 10.33:1 10.33:1 10.33:1 10.33:1 10.33:1 10.33:1 10.33:1
Russel of the control	CI Shell She	Timk Cown Cown Cown Cown Cown Cown Cown Cown
A SA	<u>€₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩</u>	**************************************
Mech Make Make Make Make Make Make Make Make	Bid Arv Spic Spic Spic Spic Spic Spic Spic Spic	Blid Oppt Oppt Oppt Oppt Oppt Oppt Oppt Opp
ADACADADADADADADADADADADADADADADADADADA	POPAGA A PAGA A A A A A A A A A A A A A A	### ##################################
PER	Full County County County County County County Court Court Court Court Court Court County Cou	Cott Cott Cott Belin Bel
MUDITURE S : S : S : S : S : S : S : S : S : S	: 0: 2 = 3 :	G: G:
	Bos	Eise Bos Eise Eise Eise Eise Eise Eise Eise Eis
Bose September 1999 S	THERE WAS BEEN	
000<00 Co 00000000000 Co 000000 Co 000000	0 -0 -0 -0 -0 -0 -0 -0 -0 -0 -0 -0 -0 -0	>>000 :>0000>000000>0>000
Strm G St		Strm V Rayf V Rayf V Rayf V Zen G Zen G Zen G Zen G Strm O
String Control of Cont	F Strm G F Strm G F Strm G F Zen	No. 10 Color of the color of th
Strm G St	P H F Strm G G C C C C G G G G	Strm V Rayf V Rayf V Rayf V Zen G Zen G Zen G Zen G Strm O
C C C C C C C C C C	A A A A B B B B B B	C C C C C C C C C C
22.41 C C T B Strm G C T C T C T C C T B Strm G C C T C T C T C C T C C T C C T C	Str. C Own B Zen G Str. G C T F Str. V C T F Str. C T F Str. C T F Str. C T F Str. C T T T T T T T T T	22.4 L C C C B Rayf V V S S 2.4 L C C T C T F Zen G G 2.2 L C C T C T F Zen G G S 2.4 L C C T C T F E Zen G G S 2.4 L C C T F E Zen G G S 2.4 L C T F E S T G G G G S 2.4 L C T F E G F S T G G G G G G G G G G G G G G G G G G
### ### ### ### ### ### ### ### ### ##	A A A A B B B B B B	4444 6 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4
Cont 445 55 5 2 5 1 C T B Strm G Cott 445 55 5 2 5 1 C C T T B Strm G Cott 445 55 5 2 5 1 C C T T B Strm G Cott 45 5 5 2 5 1 C C T T B Strm G Cott 45 5 5 2 5 1 C C T T B Strm G Cott 45 5 5 2 5 1 C C T T B Strm G Cott 45 5 5 2 5 1 C C T T B Strm G Cott 45 5 5 2 5 1 C C T T B Strm G Cott 45 5 5 5 2 5 1 C C T T B Strm G Cott 45 5 5 5 5 1 C C T T B Strm G G Cott 45 5 5 5 5 1 C C T T B Strm G G Cott 45 5 5 5 5 1 C C T T B Strm G G Cott 45 5 5 5 5 1 C C T T B Strm G G G Cott 45 5 5 5 5 5 1 C C T T B Strm G G G Cott 45 5 5 5 5 5 1 C C T T B Strm G G G Cott 45 5 5 5 5 5 1 C C T T B Strm G G G G G G G G G G G G G G G G G G G	Cont 4 ½ 5 ½ ½ 2 1 L C Own B Zen Gont 4 ½ 5 ½ ½ 2 1 L C Own B Zen Gont 4 ½ 5 ½ ½ 2 1 L C Own B Zen Gont 4 ½ 5 ½ ½ 2 1 L C T F F Strm Gont 4 ½ 5 ½ 2 1 L C T F F Strm Gont 4 ½ 5 ½ 2 1 L C T F F Strm V Sun 4 ½ 5 ½ 2 1 L C T F F Own F Strm V Sun 4 ½ 5 ½ 2 1 L C T F F Own F Strm V Sun 4 ½ 5 ½ 2 2 1 L C T F F Own F Strm V Sun 4 ½ 5 ½ 2 5 6 L C F F F F C F F F C C T F Sun V Sun 4 ½ 5 ½ 5 6 L C F F F F F F C F F F F F F F F F F F	Wau 445x 55 32.4 L C G G B Rayl V Cont 445x 55 32.4 L C G G B B Rayl V Cont 445x 55 32.4 L C T F S Zen G G Cout 445x 55 32.4 L C T S Zen G G Cout 445x 55 32.4 L C T S Zen G G Cout 445x 55 32.4 L C T S Zen G G Cout 445x 55 32.4 L C T S Zen G G Cout 445x 55 32.4 L C T S Zen G G Cout 445x 55 32.4 L C T S Zen G G Cout 445x 55 32.4 L C T S Stm G G S Zen G C Cout 445x 55 32.4 L C T S Stm G G S Zen G G C C Zen G G C C Zen G G C C Zen G G G G G G G G G G G G G G G G G G G
Secondary Application Ap	3450 Cont 445x55 32.4 L P H F Strm G 4500 Wis 45x55 27.2 L C Own B Zen G 4500 Wis 45x55 32.4 L P H F Strm G 4500 Wis 45x55 32.4 L P Own F Zen G 4500 Wis 45x55 32.4 L P Own F Zen G 4500 Wis 45x55 32.4 L P Own F Zen V 4550 Own A 45x55 32.4 L C T F Strm V 45x50 Own A 45x55 32.4 L C T F Strm V 45x50 Own A 45x55 32.4 L C T F Strm V 6500 Own A 45x55 32.4 L C T F Strm V 6500 Own A 45x55 22.5 L C Fed F Zen G 3200 Wis 45x55 32.5 L C F F Strm V 8500 Own A 45x55 32.5 L C T F Strm V 8500 Own A 45x55 32.5 L C T F Strm V 8500 Own A 45x55 32.5 L C T F Strm V 8500 Own A 45x55 32.5 L C T F Strm V 8500 Own A 45x55 32.5 L C T F Strm C Strm G 6500 Own A 45x55 32.5 L C T F Strm C 6500 Own A 45x55 33.5 L C T F Strm C 6500 Own A 45x55 33.5 L C T F Strm C 6500 Own A 45x55 33.5 L C T F Strm C 6500 Own A 45x55 33.5 L C T F Strm C 6500 Own A 45x55 33.5 L C T F Strm C 6500 Own A 45x55 33.5 L C T F Strm C 6500 Own A 45x55 33.5 L C T F Strm C 6500 Own A 45x55 33.5 L C T F Strm C 6500 Own A 45x55 33.5 L C T F Strm C 6500 Own A 45x55 33.5 L C T F Strm C 6500 Own A 45x55 33.5 L C T F Strm C 6500 Own A 45x55 33.5 L C T F Strm C 6500 Own A 45x55 33.5 L C T F Strm C 6500 Own A 45x55 33.5 L C T F Strm C 6500 Own A 5x55 Strm C 6500 Own A 5x55 Strm C 6500 Own A 5x55 Strm C 6500 Own A 5x5	Wau
2995 Cont 4 Facts 27.2 L C Own B Strm C Cont 4 Facts 27.2 L C Own B Strm C Cont 4 Facts 27.2 L C Own B Strm C C C C C C C C C	Cont 4 ½ 5 ½ ½ 2 1 L C Own B Zen Gont 4 ½ 5 ½ ½ 2 1 L C Own B Zen Gont 4 ½ 5 ½ ½ 2 1 L C Own B Zen Gont 4 ½ 5 ½ ½ 2 1 L C T F F Strm Gont 4 ½ 5 ½ 2 1 L C T F F Strm Gont 4 ½ 5 ½ 2 1 L C T F F Strm V Sun 4 ½ 5 ½ 2 1 L C T F F Own F Strm V Sun 4 ½ 5 ½ 2 1 L C T F F Own F Strm V Sun 4 ½ 5 ½ 2 2 1 L C T F F Own F Strm V Sun 4 ½ 5 ½ 2 5 6 L C F F F F C F F F C C T F Sun V Sun 4 ½ 5 ½ 5 6 L C F F F F F F C F F F F F F F F F F F	Wau 445x 55 32.4 L C G G B Rayl V Cont 445x 55 32.4 L C G G B B Rayl V Cont 445x 55 32.4 L C T F S Zen G G Cout 445x 55 32.4 L C T S Zen G G Cout 445x 55 32.4 L C T S Zen G G Cout 445x 55 32.4 L C T S Zen G G Cout 445x 55 32.4 L C T S Zen G G Cout 445x 55 32.4 L C T S Zen G G Cout 445x 55 32.4 L C T S Zen G G Cout 445x 55 32.4 L C T S Stm G G S Zen G C Cout 445x 55 32.4 L C T S Stm G G S Zen G G C C Zen G G C C Zen G G C C Zen G G G G G G G G G G G G G G G G G G G
Secondary Application Ap	3450 Cont 445x55 32.4 L P H F Strm G 4500 Wis 45x55 27.2 L C Own B Zen G 4500 Wis 45x55 32.4 L P H F Strm G 4500 Wis 45x55 32.4 L P Own F Zen G 4500 Wis 45x55 32.4 L P Own F Zen G 4500 Wis 45x55 32.4 L P Own F Zen V 4550 Own A 45x55 32.4 L C T F Strm V 45x50 Own A 45x55 32.4 L C T F Strm V 45x50 Own A 45x55 32.4 L C T F Strm V 6500 Own A 45x55 32.4 L C T F Strm V 6500 Own A 45x55 22.5 L C Fed F Zen G 3200 Wis 45x55 32.5 L C F F Strm V 8500 Own A 45x55 32.5 L C T F Strm V 8500 Own A 45x55 32.5 L C T F Strm V 8500 Own A 45x55 32.5 L C T F Strm V 8500 Own A 45x55 32.5 L C T F Strm V 8500 Own A 45x55 32.5 L C T F Strm C Strm G 6500 Own A 45x55 32.5 L C T F Strm C 6500 Own A 45x55 33.5 L C T F Strm C 6500 Own A 45x55 33.5 L C T F Strm C 6500 Own A 45x55 33.5 L C T F Strm C 6500 Own A 45x55 33.5 L C T F Strm C 6500 Own A 45x55 33.5 L C T F Strm C 6500 Own A 45x55 33.5 L C T F Strm C 6500 Own A 45x55 33.5 L C T F Strm C 6500 Own A 45x55 33.5 L C T F Strm C 6500 Own A 45x55 33.5 L C T F Strm C 6500 Own A 45x55 33.5 L C T F Strm C 6500 Own A 45x55 33.5 L C T F Strm C 6500 Own A 45x55 33.5 L C T F Strm C 6500 Own A 45x55 33.5 L C T F Strm C 6500 Own A 45x55 33.5 L C T F Strm C 6500 Own A 5x55 Strm C 6500 Own A 5x55 Strm C 6500 Own A 5x55 Strm C 6500 Own A 5x5	Wau 45x263, 28.9 L C G G B Rayi V G G G G G G G G
4600 3550 Cont 447254 27.2 L C Own B Strm G 5580 3775 Cont 447254 32.4 L C Own B Strm G 5580 3775 Cont 447254 27.2 L C T T B Strm G 5500 2995 Cont 447254 27.2 L C T T B Ray G 5500 3200 Ruda 447254 27.2 L C T B Ray G 5500 3200 Ruda 447254 27.2 L C T T B Strm G 5500 3200 Ruda 447254 28.9 L C T T B Strm G 5500 3200 Ruda 447254 28.9 L C T T B Strm G 5500 3200 Ruda 447254 28.9 L C T T B Strm G 5500 3200 Ruda 447254 28.9 L C T T B Strm G 5500 3275 Own 6 3254 L C T B Strm G 5500 3275 Own 6 3254 L C T B Strm G 5500 3275 Own 6 3254 L C T B Strm G 5500 3275 Own 6 3254 L C C T B Strm G 5500 3275 Own 6 3254 L C C T B Strm G 5500 3275 Own 6 3254 L C C T B Strm G 5500 3275 Own 6 3254 L C C C C C C C C C	Reye D	Wau 45x263, 28.9 L C G G B Rayi V G G G G G G G G
Secondary Application Ap	3450 Cont 445x55 32.4 L P H F Strm G 4500 Wis 45x55 27.2 L C Own B Zen G 4500 Wis 45x55 32.4 L P H F Strm G 4500 Wis 45x55 32.4 L P Own F Zen G 4500 Wis 45x55 32.4 L P Own F Zen G 4500 Wis 45x55 32.4 L P Own F Zen V 4550 Own A 45x55 32.4 L C T F Strm V 45x50 Own A 45x55 32.4 L C T F Strm V 45x50 Own A 45x55 32.4 L C T F Strm V 6500 Own A 45x55 32.4 L C T F Strm V 6500 Own A 45x55 22.5 L C Fed F Zen G 3200 Wis 45x55 32.5 L C F F Strm V 8500 Own A 45x55 32.5 L C T F Strm V 8500 Own A 45x55 32.5 L C T F Strm V 8500 Own A 45x55 32.5 L C T F Strm V 8500 Own A 45x55 32.5 L C T F Strm V 8500 Own A 45x55 32.5 L C T F Strm C Strm G 6500 Own A 45x55 32.5 L C T F Strm C 6500 Own A 45x55 33.5 L C T F Strm C 6500 Own A 45x55 33.5 L C T F Strm C 6500 Own A 45x55 33.5 L C T F Strm C 6500 Own A 45x55 33.5 L C T F Strm C 6500 Own A 45x55 33.5 L C T F Strm C 6500 Own A 45x55 33.5 L C T F Strm C 6500 Own A 45x55 33.5 L C T F Strm C 6500 Own A 45x55 33.5 L C T F Strm C 6500 Own A 45x55 33.5 L C T F Strm C 6500 Own A 45x55 33.5 L C T F Strm C 6500 Own A 45x55 33.5 L C T F Strm C 6500 Own A 45x55 33.5 L C T F Strm C 6500 Own A 45x55 33.5 L C T F Strm C 6500 Own A 45x55 33.5 L C T F Strm C 6500 Own A 5x55 Strm C 6500 Own A 5x55 Strm C 6500 Own A 5x55 Strm C 6500 Own A 5x5	Wau

75 86 86 86 87 77 77

Pr. Cent of Weight on Rear Wheels		
Rim Equipment	10 10 10 10 10 10 10 10	_
Wheels—Make		Fir
7		Cla
Wheelbase	176 Pier 187 Mon 187 Mon 187 Mon 187 Mon 188 Mon 188 Mon 188 Mon 189 Pier 180 Dup 180 Pier 180	
u-ta		1120
Tas D gairest	Rose	Ross
Rear Tires	36x5 40x5 40x5 40x5 40x5 36x5 36x5 36x5 36x5 40x1 36x5 40x1 36x1 40x5	36x5†
Front Tires	28 28 28 28 28 28 28 28 28 28 28 28 28 2	36x5
Springs	Shel Shel Doet Doet Shel Shel Shel Shel Shel Shel Shel Shel	-
-9H 1895 IstoT wol ni noitoub	49. 61:1 58. 6:1 50. 6:1 49. 6:1 49	-
Total Gear Re- duction in nigh	10.251 10.331 10.331 10.331 10.251 10.251 10.251 10.251 10.251 10.251 10.251 10.331	_
Rear Azle	Special Control of the control of th	1
Final Drive		
Universal	Continued A A Cown A Bypic A A Cown Bypic A A Sypic A Bypic B Bypic B Bypic A A Sypic B Bypic B B Bypic B B Bypic B B B B B B B B B B B B B B B B B B B	-
lo cottano. Tenenission	4444444 : A SAGATE A SAGA SAGA SAGA SAGA SAGA SAGA SAGA S	-
Speeds Forward	**************************************	
noissimana ₁ T	Por Paris Pa	3-Li
Clutch	HORAL STATE OF THE OFFICE OF T	_
Engine Starter	5	B
metere and iting I	Dispense	
Fuel Feed	000: 0: 0000004<0000: 000000000000000000	-
Сатригетог	Strm Skrm Skrm Skrm Skrm Skrm Skrm Skrm Sk	Mas
Lubrication	manadada ana ana ana ana ana ana ana ana	
Radiator Make or Type	MAN	_
How Cooled	3 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
Valve Arrange't	コープリングルン コープリング・リーブ・リーファット・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・	L
Horsepower	80808080808080808080808080808080808080	25.6
Bore and Stroke	AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA	4 x6
Engine—4 Cyl. unless otherwise noted	Cont Cont Lib Lib Lib Lib Lib Lib Lib Buda Buda Buda Buda Buda Buda Buda Buda	Wis
Chassis Price	4456 4450 4450 4500 4500 4500 4500 4500	4100
Chassis Weight	16800 175640 176540 176540 17000	
Model	Sty Continued Giant 7. 6800 6600	inther 70
		5

Sch Sch Cla StM Smi | 175 | Pier | 124 | Pier | 159 | Dup | 150 | Dup | 150 | Pier | Q | Dup | 180 | Pier | 162 | Cont | 166 | Own | 150 | Own | 1 49.5:1 1:1 42.35:1 5.35:1 42.35:1 37.71:1 46:1 42.5:1 Timk Dead Over -388-08888 4 :44D44 :444 מח הרט הסשו ש Bos Bos Mag Eis Eis Ber Dix Ber 0 :0>00 :0A0 016640000000

	Section 19	70 Fir. 588.5 Gdy 80 73
	SSmi SSmi SSmi SSmi SSmi SSmi SSmi SSmi	Vest mi kt.M. Say mi ini
Simp Hoo Dup Smi Own Sch	COOperate State of the control of th	Wau Nau Nau Nau Nau Nau Nau Nau Nau Nau N
156 Si 174 D 168 O	1100	178 156 156 168 168 168 168 168 168 168 168
Ross Ross Lav	Ross	Lav Gem Ross Own Ross Ross Ross
36x6† 36x10 36x5†	40x64 40	40x6† 40x7† 40x7† 40x7† 40x7 40x6 40x1 40x12
36x5 36x6 36x5	23.25.25.25.25.25.25.25.25.25.25.25.25.25.	36x6 36x6 36x5 36x5 36x6 36x6 36x6 36x6
Shel Math Shel	Skel Skel Skel Skel Skel Skel Skel Skel	Det Per Per Mer Kal Math Mer
12.76:1 49.2:1 54.84:1	48.5:11 61.11 56.43:11 56.43:11 60.5:11 60.6:11	46.2:1 49.1 49:1 60.7:1 33.7
18.75:1 10.25:1 10.25:1	10.25:11.66:11.10.25:11.25:11.10.25:11.10.25:11.10.25:11.10.25:11.10.25:11.10.25:11.10.25:11.10.25:11.10.25:11.10.25:11.10.25:11.	10.6:1 11.4:1 11.2:39:1 10.66:1 10.25:1 10.5:1
Shel Torb Shel	Timk Kunn Kunn Kunn Kunn Kunn Kunn Kunn Kun	Dead Timk Dead Dead Timk Flor Shel Cu
<u>×1</u> ×	■ 本本 B B A B B B B B B B B B B B B B B B	<u>∪≽∪≥≥≥≥−∪</u>
Spic	Budden of the property of the	Ton K-B Spic Own Spic Spic Spic Spic Spic Spic Spic Spic
144 DDA		DD
B-Li Full B-Li	BENEFIT BENEFI	Selec Selec Coyt B-Li Selec Own Coyt B-Li B-Li
<u> </u>	MECOPURED KENDULING F 4 ME 4 CACADARADODERA DO DEFENA DO DERFERA	OBA: ALCH: D
Bos Eis	Color	Bos Eis Bos Dix Dix Aer
000 8.8-		0<0: 400000
Zen Sheb	NA: ORGENERAL BERNERAL BERNERA B	Mas Rayf Rayf Rayf Rayf Rayf Cen Own Strm Sheb
F C C C C C C C C C C C C C C C C C C C	CONCENTRADARE SANTANE SANTANES	COTT FEE BS
HHH CAD		HUHHUU : 14H4
28.9	88888888888888888888888888888888888888	36.1 40.3 40.3 40.3 40.3 40.3 40.3 40.3 40.3
4½x6 28.9 L 4½x6 28.9 L 4½x5½ 32.4 L	**************************************	440 440 40 60 60 60 60 60 60 60 60 60 60 60 60 60
6520 4350 Wie 6600 3550 Wie 7000 4450 Cont	Wise Control of the C	Wau Cont Cont Cont Cont Own Cont Own
0 4350 00 3550 00 4450	100 100 100 100 100 100 100 100 100 100	0 4850 0 5300 0 5300 0 5250 0 5250 0 5450 0 5250 2 5750
	8350 8350 8350 8350 8350 8350 8350 8350	88000 9350 9350 8750 8925 8925 8925 8925 8672
	9 9 9 9 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	7 Ton
	A A A C Selection of the control of	
HW.	Ton and M. and M. bit of the control of the cont	6 and o 1919. dd 69. springfield rr 6 6. d 6.
Rowe HW. Union H	Acason M. Acason M. Acason M. Available H5. Brockway T. Capitol E. Corbitt AA. Corbit AA	51/2, 6 and Doans 1919. Hall Garlord 69. Kelly-Springfeld Macear G. Royal 6. Tiffin 4. Winther 129. Mack AC.

0		THE COMMERCIAL CA
Pr. Cent of Weight on Rear Wheels	90 90 90	80 60 80 80 80 80 80 80
Rim Equipment	Own	SAE
Wheels—Make	Cla Own Smi Smi	StM Smi Smi Smi Smi Wan Wan Wan Wan Wan
Сочетног	Dup Own Wau Wau Mon Wau Dup	Hink Phar Phar Simp Simp Simp Own Own Phar Phar Simp Phar Phar Phar Phar Phar Phar Phar Phar
Wheelbase	165 174 174 174 165	1110 1110 1110 1100 1100 1110 1110 111
Steering Gear	Ross Ro	Own Geen Geen Ross Ross Ross Ross Ross Ross Ross Gem Gem Gem Gem Com Gem
Rear Tires	40x7 40x7 40x7 40x7 40x7 40x7 40x7	36x7 36x7 36x7 36x7 40x5 40x5 36x7 36x7
Front Tires	36x6 36x7 36x7 36x6 36x6 36x6 36x6	36x4 36x4 36x5 36x5 36x5 36x5 36x5 36x4 36x4 36x4 36x7 36x7 36x6 36x7 36x7 36x7 36x7
Springs	Math Tut Shel Mer Mer Mer Math	Per Math Math Math Math Math Math Math Math
Total Gear Re- wod ni nottonb	60.5:1 37.16 54.9:1 43.6:1 66.2:1	40.7:1 59.88:1 1.:0146 11:0146 37:1145 37:116 41.5 45.26
Total Gear Re- duction in High	12.5:1 12:1 11.58 10.86:1 14:1 7:26:1	8:1 9-25:1 12:1 12:1 1:08 1:08 9-25:1 10.53 110.53 112.92 112.92
Rear Azle	CI Own D Sav Timk Own Own	Russ Timk Timk Timk Timk Dead Own Down Own Down Timk Timk Timk Timk Timk Timk Timk Timk
Final Drive	CC She Oww	★★○○○○○○ ★★★□○○○○★★★□
Universal	Cont Bld Own Spic Spic Spic UM	-Trucks -Trucks -Trucks -Trucks -Trucks
Location of Transmission	Ta Bassas	Tractor
Speeds Forward	40.44 :04	044444 :0000044 :40000044
појевітелатТ	B-Li Own Own Cwn Own	Cover
Clutch	OK: FKO: B	###HHAMAMAMAMAMAMAMAMAMAMAMAMAMAMAMAMAMA
Engine Starter	9 mo ::: 0 ::	900
Ignition System	51/2, Eis Aer Bos Bos Bos Bos Bis Bes	Bos Eis Eis Bos Mas Eis Mas Eis Mas Eis Aer Aer Aer Aer Aer Bos Bos Bos Bos Bos Bos Bos Bos Bos Bos
Fuel Feed	>000> :>0	: 00000 :00>>0 :400000 ::
Carburetor	Mas Strm Zen Strm Strm Rayf Strm	Strm Zen Zen Strm Rayf Strm Rayf Strm Rayf Strm Zen
Lubrication	CHWWW ::O	HHHEFFFFFFFFFFFFFFFFFFFFFF
Radiator Make or Type	Chic EM	TTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTT
How Cooled	4000000	000000000000000000000000000000000000000
Valve Arrange't	<u> </u>	ברבנהר: חוובה חווהה
тэмодэелоН	0440864408 8204408	22222222222222222222222222222222222222
Bore and Stroke	ed 5 x6 5 x6 5 x6 5 x6 5 x6 5 x6 x 7 5	44440404004004400400444
Engine—4 Cyl. unless otherwise noted	Wis Wau Wau Wau Wis Ster Beav	Hink Cont Cont Buds Wiss Buds Own Her Speed Own Own Own Own Own Own Cont Cont Cont Cont Cont Cont Cont Con
Chassis Price	6000 6000 6250 6000 5400	711C 330550 40255 32290 4025 3400 3450 6000 3450 6000 3450 6000 6000 6000 6000
Chassis Weight	Cont	4000 6800 6800 6800 6800 4750 8450 1000 1000 8000 8272 8250 8272 8650 8650 8650
Model	51/2. 6 and 7 Ton—Continued Winther 140. Lb-6. 12000 5500 Wis 5 Couple Gear Lb-6. 12000 Wis 5 Mack AC. 12000 Wis 5 Old Reliable K. L. M. 10240 6250 Wau 4 Royal T-4-120 Wau 5 Sterling 71/4-Chain. 1000 6000 Sterling 8-800 6000 6000 Sterling 8-800 6000 6000 6000 6000 6000 6000 6000 6000 6000	Casoline Tractor-Trucks Columbia T. 4000 2750 Hi Federal Light Duty 4700 3050 Co Garford 70FT 4700 3205 Co Garford 77CT 4700 4400 Wi Garford 77CT 7200 4400 Wi Garford 68T 7200 100 Wi Hood 2000 1425 Ow Junbo C. 2460 3095 Bu Knox 35. 8500 0000 Ow Knox 36. 8500 0000 Ow Knobler M.T. 4750 4450 3095 Bu Kuhn 8000 0000 Ow Mack AB 5.Ton 4750 He Mack AB 5.Ton 4750 940 3400 Ow Mack AB 5.Ton 8000 Mack AC 10-Ton 8250 5500 Ow Mack AC 10-Ton 8250 5500 Ow Mack AC 10-Ton 8650 6000 Ow

Electric Commercial Cars	ial Car	S				Elec	tric Cor	Electric Commercial Cars	Cars								
E. C. M. Name and Model Number	Carrying Capacity	tdgisW sisaadO	Spirt alasadO	beedS mumixaM	Battery	Mileage Per Charge	Motor	Controller	Speeds Forward	Drive	Rear Azle	syning8	Front Tires	вэліТ твэЯ	Steering Gear	Wheelbase	Pr. Cent of Weight on Rear Wheels
Ward WS. C-T ½ Walker M Atlantie 1C Ward WA C-T 1 C-T 2 C-T 2 Atlantie 2C C-T 3½ Ward WF Ward WF Ward WF Ward WF Ward WF C-T 3½ Ward WF Walker P Walker P	750 1000 2000 2000 2000 2000 4000 4000 400	1400 1800 2770 2770 2770 2770 2780 2780 3590 3590 3590 3590 6230 6230 6230 6600 6630 6600 6630 6600 6630 1000 6630 6600 6630 1000 6630 1000 6630 663	2300 2700 3900 4400	100 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Popular de la composition della composition dell	80 888888888888888888888888888888888888	0004€6666666666666666666666666666666666	O wn	食食ら食食食ら食食食ら食ら食食ららら食らい食るる	#000\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	Shel Flot Timk Shel Flot Own Dead Own Own Own Shel Timk Own Own Own Own	Shell	33644 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	32x3 36xx3 36xx3 36xx4 36xx4 36xx4 36xx4 36xx4 36xx4 36xx4 40x5 36xx6 40x7 40x7 40x6 40x6 40x6 40x6 40x6 40x6 40x6 40x6	Own Roes Roes Cown W W W W W W W W W W W W W W W W W W W	888 889 989 980 100 100 100 100 100 100 100 100 100 1	600 600 600 600 600 600 600 600 600 600

Manufacturers Whose Models Are Included in Specifications on Preceding Pages

Acason—Acason Motor Truck Co., Detroit, Mich.
Ace—American Motor Truck Co., Newark, Ohio.
Acme—Acme Motor Truck Co., Cadillac, Mich.
All-American—All-American Truck Co., Chicago, Ill.
Apex—Hamilton Motor Co., Grand Haven, Mich.
Armleder—O. Armleder Co., Cincinnati, Ohio.
Atlantic—Atlantic Electric Vehicle Co., Newark, N. J.
Atlas—Martin Truck & Body Corp., York, Pa.
Atterbury—Atterbury Motor Car Co., Buffalo, N. Y.
Autocar—Autocar Co., Ardmore, Pa.
Available—Available Truck Co., Chicago, Ill.

Beck-Hawkeye-Beck-Hawkeye Motor Truck Works, Cedar Rapids.

Beck-Hawkeye—Beck-Hawkeye Motor Truck Works, Cedar I Iowa.

Bell—Iowa Motor Truck Co., Ottumwa, Ia.

Belmont—Belmont Motors Corp., Lewistown, Pa.

Bessemer—Bessemer Motor Truck Co., Grove City, Pa.

Bestelehem—Bethlehem Motor Truck Corp., Allentown, Pa.

Betz—Betz Motor Truck Co., Hammond, Ind.

Birch—Birch Motor Cars, Chicago, Ill.

Brinton—Brinton Motor Truck Co., Philadelphia, Pa.

Briscoe—Briscoe Motor Corp., Jackson, Mich.

Brockway—Brockway Motor Truck Co., Cortland, N. Y.

Brockway—Brockway Motor Truck Co., Cortland, N. Y.

C. T.—Commercial Truck Co. of America, Philadelphia, Pa.
Capitol—Capitol Motors Corp, Fall River, Mass.
Chevrolet—Chevrolet Motor Co. of Mich., Flint, Mich.
Chicago—Chicago Motor Truck Inc., Chicago, Ill.
Clydesdale—Clydesdale Motor Truck Co., Clyde, Ohio.
Collier—Collier Motor Truck Co., Bellevue, Ohio.
Collimbia—Columbia Motor Truck & Trailer Co., Pontiac, Mich.
Comet—Comet Automobile Co., 156 S. Water St., Decatur, Ill.
Comerce—Commerce Motor Car Co., Detroit, Mich.
Concord—Abbot-Downing Truck & Body Co., Concord, N. H.
Conestoga—Conestoga Motor Truck Co., Lancaster, Pa.
Corbitt—Corbitt Motor Truck Co., Henderson, N. C.
Couple Gear—Couple Gear Freight Wheel Co., Grand Rapids, Mich.

Couple Gear—Couple Gear Freight Wheel Co., Grand Rapids,
Dart—Dart Truck & Tractor Corp., Waterloo, Ia.
Day-Elder—Day-Elder Motors Corp., Newark, N. J.
Dearborn—Dearborn Truck Co., Chicago, Ill.
Defiance—Defiance Motor Truck Co., Defiance, Ohio.
DeKalb—DeKalb Wagon Co., DeKalb, Ill.
Denby—Denby Motor Truck Co., Detroit, Mich.
Dependable—Dependable Truck & Tractor Co., Galesburg, Ill.
Diamond T—Diamond T Motor Car Co., Chicago, Ill.
Diehl—Diehl Motor Truck Works, Philadelphia, Pa.
Dispatch—Dispatch Motor Car Co., Minneapolis, Minn.
Doane—Doane Motor Truck Co., San Francisco, Cal.
Dodge—Dodge Bros., Detroit, Mich.
Dorris—Dorris Motor Car Co., St. Louis, Mo.
Double Drive—Double Drive Truck Co., Chicago, Ill.
Douglas—Douglas Motors Corp., Omaha, Nebr.
Duplex—Duplex Truck Co., Lansing, Mich.
Eagle—Eagle Motor Truck Corp., St. Louis, Mo.

Eagle—Eagle Motor Truck Corp., St. Louis, Mo. Ellsworth—Mills-Ellsworth Co., Keokuk, Ia. Elmira—Elmira Commercial Motor Car Co., Inc., Owego, N. Y. Erie—Erie Motor Truck Mfg. Co., Erie, Pa.

F. W. D.—Four Wheel Drive Auto Co., Clintonville, Wis. Fageol—Fageol Motors Co., Oakland, Cal. Famous—Famous Trucks, Inc., St. Joseph, Mich. Fargo—Fargo Motor Truck Co., Chicago, Ill. Federal—Federal Motor Truck Co., Detroit, Mich. Ford—Ford Motor Co., Highland Park, Mich. Forschier—Forschier Motor Truck Mfg. Co., New Orleans, La. Front Drive—Double Drive Truck Co., Chicago, Ill. Fulton—Fulton Motor Truck Co., New York, N. Y.

G. M. C.—General Motors Truck Co., New York, N. 1.

G. M. C.—General Motors Truck Co., Pontiac, Mich.
Gabriel—Gabriel Motor Truck Co., Cleveland, Ohio.
Garford—Garford Motor Truck Co., Lima, Ohio.
Gary—Gary Motor Truck Co., Gary, Ind.
Gersix—Gersix Mfg. Co., Seattle, Wash.
Glant—Giant Truck Corp., Chicago Heights, Ill.
Graham—Graham Brothers, Evansville, Ind.
Gramm-Bernstein—Gramm-Bernstein Motor Truck Co., Lima, Ohio.
Grant—Grant Motor Car Corp., Truck Division, Cleveland, Ohio.

Grant—Grant Motor Car Corp., Truck Division, Cleveland, Hahn—Hahn Motor Truck & Wagon Co., Hamburg, Pa. Hall—Lewis-Hall Motors Corp., Detroit, Mich. Harvey—Harvey Motor Works, Detroit, Mich. Hawkey—Hawkeye Truck Co., Sioux City, Ia. Hendrickson—Hendrickson Motor Truck Co., Chicago, Ill. Hewitt-Ludlow—Ralston Iron Works, San Francisco, Cal. Highway-Knight—Highway Motors Co., Chicago, Ill. Higrade—Higrade Motors Co., Harbor Springs, Mich. H & M—H & M Motor Truck Co., Inc., Baltimore, Md. Hoover—Hoover Wagon Co., York, Pa. Huffman—Huffman Bros. Co., Elkhart, Ind. Huriburt—Huriburt Motors, Inc., New York, N. Y.

Independent—Independent Motor Co., Youngstown, O. Independent—Independent Motor Truck Co., Inc., Davenport, Ia. Indiana—Indiana Truck Corp., Marion, Ind. International—International Harvester Co., Chicago, Ill.

Jackson—Jackson Motors Corp., Jackson, Mich. Jones—Jones Motor Car Co., Wichita, Kans. Jumbo—Nelson Motor Truck Co., Saginaw, Mich.

Jumbo—Nelson Motor Truck Co., Saginaw, Mich.

Kalamazoo—Kalamazoo Motor Corp., Kalamazoo, Mich.
Kankakee—Kankakee Automobile Co., Kankakee, Ill.
Karavan—Caravan Motors Co., Portland, Ore.
Kearns—Kearns-Dughie Motors Co., Beavertown, Pa.
Keldon—House Cold Tire Setter Co., St. Louis, Mo.
Keldon—House Cold Tire Setter Co., St. Louis, Mo.
Kelly-Springfield—Kelly-Springfield Motor Truck Co., Springfield,
Ohio.

Keystone—Keystone Motor Truck Corp., Philadelphia, Pa.
Kimball—Kimball Motor Truck Co., Los Angeles, Cal.
King Zeitler—King Zeitler Co., Chicago, Ill.
Kissel—Kissel Motor Car Co., Hartford, Wis.
Klelber—Kleiber & Co., Inc., San Francisco, Cal.
Knox—Knox Motors Co., Springfield, Mass.
Koehler—H. J. Koehler Motors Corp., Newark, N. J.
Kuhn—Kuhn Tractor Truck Co., Seattle, Wash.

Lange—Lange Motor Truck Co., Pittsburgh, Pa.
Larrabee-Deyo—Larrabee-Deyo Motor Truck Co., Inc., Binghamton, N. Y.
L. M. C.—Louisiana Motor Car Co., Shreveport, La.
Lombard—Lombard Auto Tractor Truck Corp., New York, N. Y.
Luedinghaus—Luedinghaus-Espenschied Wagon Co., St. Louis, Mo.
Luverne—Luverne Automobile Co., Luverne, Minn.

Maccar—Maccar Truck Co., Scranton, Pa.

Mack—International Motor Co., New York, N. Y.

Marshall—Marshall Mfg. Co., Chicago, Ill.

Master—Master Trucks, Inc., Chicago, Ill.

Maxwell—Maxwell Motor Co., Inc., Detroit, Mich.

Menominee—Menominee Motor Truck Co., Menominee, Mich.

Moreland—Moreland Motor Truck Co., Los Angeles, Cal.

Muskegon—Muskegon Engine Co., Muskegon, Mich.

Mutual—Mutual Truck Co., Sullivan, Ind.

Napoleon—Napoleon Motors Co., Traverse City, Mich. Nash—Nash Motors Co., Kenosha, Wis. Nelson-LeMoon—Nelson & LeMoon, Chicago, Ill. Netco—New England Truck Co., Fitchburg, Mass. Niles—Niles Motor Truck Co., Pittsburgh, Pa. Noble—Noble Motor Truck Co., Kendallville, Ind. Northway—Northway Motors Co., Natick, Mass. Northwestern—Starr Carriage Co., Seattle, Wash. Norwalk—Norwalk Motor Car Co., Martinsburg, W. Va.

O. K.—Oklahoma Auto Mfg. Co., North Muskogee, Okla. Ogden—Ogden Motor & Supply Co., Chicago, Ill. Old Hickory—Kentucky Wagon Mfg. Co., Louisville, Ky. Old Reliable—Old Reliable Motor Truck Co., Chicago, Ill. Oldsmobile—Olds Motor Works, Lansing, Mich. Oneida—Oneida Motor Truck Co., Green Bay, Wis. Oshkosh—Oshkosh Motor Truck Mfg. Co., Oshkosh, Wis.

Packard—Packard Motor Car Co., Detroit, Mich.
Paige—Paige-Detroit Motor Car Co., Detroit, Mich.
Parker—Parker Motor Truck Co., Milwaukee, Wis.
Patriot—Patriot Motors Co., Lincoln, Neb.
Pierce-Arrow—Pierce-Arrow Motor Car Co., Buffalo, N. Y.
Pioneer—Pioneer Motor Truck Co., Detroit, Mich.
Pittsburgher—Pittsburgh Truck Mfg. Co., Pittsburgh, Pa.
Pony—Minnesota Machinery & Foundry Co., Minneapolls, Minn.

Rainier—Rainier Motor Corp., Flushing, L. I., N. Y. Reilance—Rellance Motor Truck Co., Appleton, Wis. Rennoc—Rennoc-Leslie Motor Co., Philadelphia, Pa. Reo—Reo Motor Car Co., Lansing, Mich. Republic—Republic Motor Truck Co., Inc., Alma, Mich. Republic—Republic Motor Truck Co., Mt. Clemens, Mich. Riker—Locomobile Co. of America, Bridgeport, Conn. Riker—Locomobile Co. of America, Bridgeport, Conn. Rock Falls—Rock Falls Mfg. Co., Sterling, Ill. Rowe—Rowe Motor Mfg. Co., Lancaster, Pa. Royal—Royal Motor Truck of N. Y., New York, N. Y.

Royal—Royal Motor Truck of N. Y., New York, N. Y.

Sandow—Sandow Motor Truck Co., Chicago, Ill.

Sanford—Sanford Motor Truck Co., Syracuse, N. Y.

Schacht—G. A. Schacht Motor Truck Co., Cincinnati, O.

Schwartz—Schwartz Motor Truck Co., Reading, Pa.

Selden—Selden Truck Corp., Rochester. N. Y.

Service—Service Motor Truck Co., Wabash, Ind.

Shaw—Walden W. Shaw Livery Co., Chicago, Ill.

Signal—Signal Motor Truck Co., Detroit, Mich.

Southern—Southern Truck & Car Corp., Greenboro, N. C.

Spacke—Spacke Machine & Tool Co., Indianapolis, Ind.

Standard—Standard Motor Truck Co., Detroit, Mich.

Sterling—Sterling Motor Truck Co., Milwaukee, Wis.

Stewart—Stewart Motor Corp., Buffalo, N. Y.

Stoughton—Stoughton Wagon Co., Stoughton, Wis.

Sullivan—Sullivan Motor Truck Co., Atlanta, Ga.

Superior—Superior Motor Truck Co., Atlanta, Ga.

Texan—Texas Motor Car Asso., Fort Worth, Texas.
Tiffin—Tiffin Wagon Co., Tiffin, Ohio.
Titan—Titan Truck Co., Milwaukee, Wis.
Tower—Tower Motor Truck Co., Greenville, Mich.
Traffic—Traffic Motor Truck Corp., St. Louis, Mo.
Transport—Transport Truck Co., Mt. Pleasant, Mich.
Traylor—Traylor Eng. & Mfg. Co., Cornwells, Pa.
Triangle—Triangle Motor Truck Co., St. Johns, Mich.
Triumph—Triumph Truck & Tractor Co., Kansas City, Mo.
Twin City—Twin City Four Wheel Drive Co., Inc., St. Paul, Minn.

Ultimate—Vreeland Motor Co., Inc., Newark, N. J.
Union—Union Motor Truck Co., Bay City, Mich.
United—United Motors Co., Grand Rapids, Mich.
U. S.—United States Motor Truck Co., Cincinnati, Ohio.

Velle—Velle Motors Corp., Moline, Ill. Victor—Victor Motor Truck & Trailer Co., Chicago, Ill. Vim—Vim Motor Truck Co., Philadelphia, Pa.

Walker-Walker Vehicle Co., Chicago, Ill.
Walker-Johnson-Walker-Johnson Truck Co., Woburn, Mass.
Walter-Walter Motor Truck Co., New York, N. Y.
Ward-Ward Motor Vehicle Co., Mt. Vernon, N. Y.
Ward-La France-Ward La France Truck Co., Inc., Elmira, N. Y.
Watson-Watson Wagon Co., Canastota, N. Y.
Wells-Evans Truck & Axle Co., Auburn, Ind.
White-White Co., Cleveland, Ohio.
White Hickory-White Hickory Wagon Mfg. Co., Atlanta, Ga.
Wichita-Wichita Falls Motor Co., Wichita Falls, Tex.
Wilcox-H. E. Wilcox Motor Co., Minneapolis, Minn.
Wilson-J. C. Wilson Co., Detroit, Mich.
Winther-Winther Motor Truck Co., Kenosha, Wis.
Witt-Will-Witt-Will Co., Inc., Washington, D. C.
Wolverine-American Commercial Car Co., Detroit, Mich.

Price List, Maximum Capacities and Inflation Pressures of Large Size Pneumatic Tire Casings

36 x 6 38 x 7 40 x 8 42 x 9		44 x 10		
Price Carrying Capacity Inflation Pressure Price Capacity Inflation Pressure Price Inflation Pressure Inflation Inflation Inflation Inflation Inflation Inflation Inflation	Price	Carrying	Inflation Pressure	
Amazon Rubber Co., Akron, O.		.00	HH	
Amazon Cord, non-skid		****	***	
Americord, non-skid				
Bergougnan Cord, non-skid	328.25	5800	130	
Braender Rubber & Tife Co., Rutherford, N. J. Braender Super Cord, non-skid				
Brunswick Balke-Collander Co., Chicago, III. Brunswick Cord, Skid-Not 98.50		****		
Curtis Tire & Rubber Co., Muskegon, Mich.		****	***	
Empire Tire & Rubber Co., Trenton, N. J.		****	***	
Empire Cord, Gray, non-skid		****		
Falls Rubber Co., Cuyahoga Falls, O. Falls Cord, Neverslip			***	
Federal Rubber Co. of Ill., Cudahy, Wis. Federal Cord, non-skid				
Firestone Cord, non-skid	0 380.65	6000	130	
Fisk Rubber Co., Chicopee Falls, Mass.		0000	204	
General Tire & Bubber Co Akron O		****	***	
General Cord, non-skid	417.45	6000	130	
Goodrich Cord, Ribbed				
Goodyear Tire & Rubber Co., Akron, O.		****		
Goodyear Cord, Ribbed	0 380.65	5800	130	
Hewitt Rubber Co., Buffalo, N. Y. Hewitt Cord. non-skid 132.60 2000 90 187.50				
Howe Rubber Co., Inc., New Brunswick, N. J.			***	
Howe Rubber Co., Inc., New Brunswick, N. J. Howe Ultra Cord, non-skid			4.4%	
India Cord, non-skid 108.30			***	
Odell Cord, rough 119.35 2000 90 168.80 2700 100 Kelly-Springfield Cord, grooved 120.00 160.00 200.00 Kelly-Springfield Cord, BB 120.00 160.00 200.00				
Kelly-Springfield Cord, grooved 120.00 160.00 200.00		,		
MCGPAW LIPE & RUDDER CO., Cleveland, O		****	***	
McGraw Cord, ribbed 131.25 McGraw Cord, non-skid 121.25				
McGraw Cord, ribbed 131.25 McGraw Cord, non-skid 131.25 Marathon Tire & Rubber Co., Cuyahoga Falis, O.				
Marathon Cord, Angre 120.00 2200 100	* *****		***	
Mason Cord, non-skid		****		
Miller Rubber Co., Akron, O. Miller Cord, Geared-to-the-Road 104.70 2200 90 148.05 3000 100 190.75 4000 110			***	
Mohawk Rubber Co., Akron, O. Mohawk Cord, non-skid		****		
Norwalk Cord, non-skid				
Oldfield Tire Co., Cleveland, O. Oldfield Cord, anti-skid				
Pennsylvania Rubber Co., Jeannette, Pa.			***	
Vacuum Cup Cord				
la. 119.35 2000 100 168.80 2450 100 217.40 3650 110		****	***	
Portage Cord. Daisy				
Racine Multi Mile Cord, non-skid 98.20 2200 90 138.90 3000 100 178.95 4000 110				
Racine Rubber Co., Racine, Wis. Racine Multi Mile Cord, non-skid 98.20 2200 90 138.90 3000 100 178.95 4000 110 Republic Rubber Co., Youngstown, O. Republic Grande Cord, Staggard Tread 129.00 2200 90 182.45 3000 100 235.05 4000 110				
Star Rubber Co., Akron, C.				
Star Cord, "All Star" 144.00 2200 90 192.00 3000 100 240.00 4000 110 Swinehart Tire & Rubber Co., Akron, O. Swinehart Cord, Hexagon 101.45				
United States Tire Co., New York City.		****	400	
U. S. Nobby Cord	0 380.65	6000	130	

Exhaust Gases in Vehicular Tunnels

A. C. Feildner, supervising chemist of the Pittsburgh Experiment Station, of the United States Bureau of Mines, has made an interesting report upon automobile exhaust gases in vehicular tunnels. The problem is of immediate importance because a 8000 ft. tunnel is now being designed to pass under the Hudson River between New York and New Jersey. Another tunnel at Pittsburgh 5700 ft. long has been proposed to connect Bostom and East Boston, Mass. Other tunnels are expected soon in various parts of the United States.

These automobile exhaust gas tests, when completed will be of great value to owners of passenger cars and trucks,

and to dealers, furnishing reliable, unbiased information. Tests already made show no difference in efficiency of different makes of motor vehicles as regards gasoline economy, but cars of the same make showed large variations, because owners were running engines with improper adjustment of carburetors, and using very rich mixtures. In tests of 24 cars 20 per cent to 30 per cent of the heat in the gasoline went out in the form of unburned gases in the exhaust. Leaner mixtures would have given 25 per cent greater mileage per gasoline gallon.

Mechanically and manually operated hoists of all descriptions will be featured in the next issue of The Commercial Car Journal.

Trucks Take Part in Japan's Progress

Japan has made plenty of money during the war, and with it she is going to provide herself with buildings of steel and concrete construction. With this construction will be opened new and important fields for the exploitation of motor trucks.

The George A. Fuller Co., a contracting concern that operates all over the United States, has placed an initial order with the International Motor Co. for six Mack trucks, which are to be shipped to Japan within the next two months. These trucks will begin work in Tokio, where the company has a contract that will take five years to complete, and where they will soon open a branch office.

TRUCK EQUIPMENT AND APPLIANCES









The Z-E Piston Ring

manufactured by the Goshen Specialty

Mfg. Co., Goshen, Ind., is the flange which upon compression not only seals the piston, but the walls of the cylinder,

also, in addition to the standard pressure exerted by the natural expansion of the

ring. Then again, while the piston head

is traveling through its other movements

completing the circle, the ring is said to

contract, thereby reducing friction. One

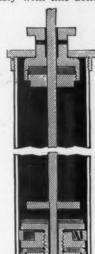
The feature of the Z-E piston ring



Hess Mercury Model H Carburetor

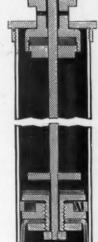
There are several unique features in the model "H" carburetor, being pro-duced by the Hess Mercury Carburetor Mfg. Co., Valparaiso, Ind. This carbu-retor has a calibrating adjustment, by which the initial air passage can be varied to the proper area to accommodate any type of engine. The area of this initial passage is controlled, by a thermostat, which maintains the proper air velocity and vacuum required at any temperature. Another feature of this carbu-retor is the delivery of the fuel to the upper surface of the air stream in a thin film. This distributes the fuel over the entire upper surface of air stream, from

The Fapco is a single action pump with valves operated by a positive movement. On the downward stroke of the piston, the valve at the head of the piston automatically closes, compressing the air and forcing it through the hose into the fire. simultaneously with this action, the valve



Sectional View of the Cylinder of the Fapco Pump. This Cylinder is 11/4 in. Diam. and 20 in. Long

at the head of the cylinder opens. The suction created by the receding piston draws in air after it. This suction continues until the piston has completed its stroke. On the upward stroke, this valve is closed permitting a reverse action in which the air passes from this chamber through the piston valve into the new compressing compartment.



Goshen Z-E Two-Way Sealing Piston Ring

ring is said to be sufficient for one piston. It is made in all sizes and oversizes and sells at \$2.50.

Bosch Magneto is Replete With Changes

The new Bosch magneto known as the type B, manufactured by the American Bosch Magneto Corp., Springfield, Mass., which was shown at the 1920 Automobile, Truck and Tractor shows, although equal electrically and mechanically to all other

types which have preceded it, represents a most marked change in magneto design for some vears.

It is not only simple in construction, but unusual. Many opportunities for sealing the magneto against against the ingress of water, oil and other foreign substances without reverting to the conventional and expensive and time-consuming

methods of obtaining a closeness of fit, which is most essential when ignitive systems are more or less exposed to the elements, are presented in the new model.

The frame of this magneto is cast of aluminum and includes not only the magneto base, but also the pole shoes and shaft and plate. The armature and interrupter are of the standard Bosch construction. The armature rotates on ball bearings, which are packed in grease making it unnecessary to oil this part.



Hess Mercury Model H Carburetor Replete With Features

whence it will pass downward through the stream of air. The maker states this greatly assists the process of absorption. Thus the liquid fuel will seek the lower surface of the passage and therefore must pass through the entire air stream, which moves rapidly and is below atmospheric pressure. Another feature is the strangler, which is positive yet flexible and permits quick getaway with a cold engine.

Fapco Single Barrel Pump

The Fapco Air Pump featured by two valves and a cup leather and steel expansion piston ring, piston equipment is the product of the Force Air Pump Co., 203 S. Oak St., Jefferson, Ia. This pump which is supported by a pressed steel base includes a 11/4 x 20 in. seamless brass cylinder. The quality of material chosen and the workmanship and design of this pump is claimed to give maximum capacity with minimum leakage.



New Bosch Type B Magneto for Trucks, Tractors and Automobiles

The distributor member is of a new design and is furnished in both the brush and jump spark types. The jump spark is known as ED. No. 1 and the brush type as ED. No. 2. Intermeshing gears, one of which is mounted on the armature shaft and the other on the distributor rotor shaft, drives the distributor rotor. This design is claimed to insure noiseless operation. High-tension current is lead from the slip-ring collector brush to the distributor by a high-tension cable, which is attached to the center terminal upon the distributor block.

The type B magneto may be obtained with either of two styles of interrupter housings and cams. The first is the standard Bosch housing and arm. The second is the new style housing and timing arm which consists of a cast arm and band encircling the housing. This housing is perfectly plain carrying no broaching, the band being held tightly in position by a screw which binds its ends together. This screw in turn fastens the ends to the cast arm.

Sturges Cord Tire Sole

The Sturges Cord Tire Sole, designed to fit over all sizes of cord tires, was recently introduced by the Sturges Tire &



Rubber Co., Oakland, Cal. This new tire sole is made from live, resilient rubber and standard weave cord tire fabric, similar to that used in the construction of cord tires.

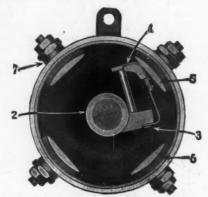
Before attaching this tire sole, the casing is cleaned of all rubber projections by buffing until the surface is smooth. Then after applying a cold cure self-vulcanizing cement, the tire sole is placed entirely over it. In addition to the grip secured by the cement, the sole is held to the rim by inflation as the regular tire.

Economy Timer for Fords

A new timer not requiring lubrication and featured by simplicity and long wear, is the new product of the Economy Timer Co., 25 Grand St., Norwalk, Conn.

Referring to Fig. 1, a clear conception of the spring shoe which is made in two parts may be obtained. The spring is

made of phosphorus bronze, and the shoe, or contact making end of the hardened steel. One screw retains the spring shoe in place, a feature which enables the easy replacement of this part. The inner mechanisms are encased in a body made of a die metal of zinc and tin. The construction of the case is such that ample clearance is provided for the fan belt. The fibre bushing of the binding screw is in-



Working Parts of the Economy Timer This timer is simple in construction, has hardened steel contacts and contact maker. No lubrication is required

serted through the fibre insulator under the contact piece assuring positive insulation. As this timer is not oiled the ill effects of dirt, that would otherwise accummulate, is obviated.

The screw retains the contact maker spring, as illustrated by Fig. 3. The insulator is beneath the stationary contact, as shown in Fig. 6, and the bushing insulator is shown in Fig. 7.

This timer retails at \$2.50.

Neutral Stop for the Ford Clutch Pedal

A new product for the Ford car is being introduced by George G. Porter, Keith Theatre Bldg., Syracuse, N. Y. The purpose of this device is to prevent the driver from pushing the clutch pedal into low gear unintentionally. It is made of cold rolled steel, nicely blued and finished. The outfit consists of a steel floor plate, screwed to the floorboard of the car and an attachment for the clutch pedal lever. This attachment has a stop member and a



Porter Safety Neutral Stop
Prevents the driver from inadvertantly pushing
the clutch pedal from high into low

release latch, so that when the pedal is pushed forward it must stop at the neutral point. Thus it prevents the pedal from being pushed further until the release is depressed. The price of this device is \$2.50.

Electric Window Salesman

A silent salesman in the form of a revolving table was shown by the Electric Window Salesman Company, 6 Beacon Street, Boston. It consists of an attractively and well-made circular table that is revolved by an electric motor, and the drive is through a shaft with universal joints. The motor consumes but little current and can be easily hidden from sight as can the driving shaft. Sufficient length of cord with plug for lighting socket is supplied. The window salesman can be utilized in the show room as well as window and is sufficiently sturdy to permit of pyramiding the accessories, etc., shown.

New Bergougnan Cord Tires

A new cord tire of the single-cure wrapped process has been announced by the Bergougnan Rubber Corp., Trenton, N. J. It is manufactured in all sizes up to the 40 x 8 in. size. It has a black tread with grey side walls. Each ply of the cord fabric is not only impregnated with high-grade rubber, but also heavily coated with it. The first ply of cord forming the interior of the casing is heavily coated



The Bergougnan Cord Tire

with a special rubber compound, which gives protection from excessive heat and tends to increase the life of the tire. Side wall troubles and shoulder separation are stated to have been eliminated by certain methods in the manufacture of this tire, which distribute road shocks over a large area. Another feature is that the side walls are given protection by the extending of the tread well around on the side

New International Chamber of Commerce

WASHINGTON, April 1.—The new International Chamber of Commerce, projected at the International Trade Conference at Atlantic City last October, will be formally organized at Paris during the week of June 21. About 100 American delegates will be present.

New One-Piece Plug

A new one-piece plug has been brought out by the Furber Co., 614 Washington St., Lynn, Mass. The steel shell is large in size and the porcelain insulator is well made and stated to withstand the high voltage of the modern magneto. The



Furber One-Piece 100 Per Cent Spark Plug

electrodes are nickel manganese alloy, the center wire of which is cemented and baked in to allow for expansion and contraction. The maker states that in view of the special methods of manufacturing employed in the production of these plugs, there is no danger of the porcelain breaking. The joint is also made gas-tight.

Boyce Fire Extinguisher is Mounted Beneath the Hood

The Boyce-Veeder Corp., Long Island City, N. Y., a newly formed company, is producing the Boyce-Veeder Fire Extinguisher. This product was invented by Harrison Boyce who also invented and helped to make the Boyce Moto-Meter. This new device is an automatic sprinkler and hand operated extinguisher. It is attached under the hood



Boyce Fire Extinguisher in Operation

of the vehicle. Action may be either automatic or manual. If fire should start beneath the hood, the chemical contained in this extinguisher is immediately released, spraying the entire engine and extinguishing the fire. It is claimed that an overheated engine will not effect its operation. The extinguisher lists at \$6 for the small size and \$8 for the larger size.

Permaseal Oil Groove Piston Ring

The Grundy Manufacturing Corporation of Detroit, makers of the Permaseal piston ring, have recently brought out an oil wiping ring for use in engines of all types and is designed to remedy oil troubles of an excessive nature. This ring is precisely the same in every way as

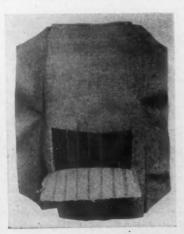


Vacuum Creating Groove in Permaseal Ring

the standard Permaseal ring, possessing its one-piece feature and dovetail, interlocking joint, with the exception that it has a groove machined into it, which upon coming into contact with the wall of cylinders creates a vacuum within the groove which wipes all excess oil off and returns it to the base of the motor. Like all Permaseal rings the oil groove ring has a turned, not-ground surface, this the manufacturers claim practically eliminates the necessity of "running or lapping in" and makes the ring quick and even seating.

Steel-Lined Inner Blow-Out Patch

A new ribbed steel inner boot for tires is being produced by Manly Seymour, Hesperia, Mich. The feature of this boot



Manly Seymour Inner Blow-Out Patch

is its construction with layers of thin steel. The boot is flexible and has five plies of heavy gum fabric. Spring steel strips, 3/6-in. wide, laid 1-16 in. apart, are placed between two of the pieces of gum fabric, these being vulcanized together on each side of the steel, thus retaining the steel strips firmly. The

maker states these boots will withstand a pressure of 500 lb. and will give great mileage.

Ingram Triple Seal Piston Rings

The Ingram Triple Seal Piston Ring consists of two types, the regular and the DeLuxe, produced by the Ingram Motor Co., Inc., 519 Globe Bldg., Newark, N. J.

These rings are of the two-piece type,



De Luxe Type of Ingram Ring
This illustration shows the ring angle interlocking seal, the lip that fits into the inner and
seals the joint of the lower ring



Ingram Regular Piston Ring
Showing the eccentric locking seal in the form
of a lip that fits over the ends of the
lower ring

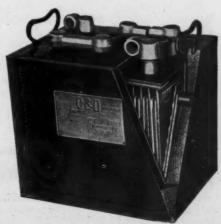
but are inserted in the piston ring grooves as one piece and are locked by a lip, which prevents any oscillating movement between these two parts. This locking lip also provides a continuous seal at both joints, lessening the chances of leakage of compression and passage of lubricating oil.

These rings are made of a special mixture of gray iron. DeLuxe type sells at \$1.50 up to \$2.25 each. The regular type sells for \$1.35 to \$2.00.

C & D Storage Battery

The Carlile & Doughty Co., Inc., 2530 N. Broad Street, Philadelphia, Pa., is offering a storage battery for starting and lighting system.

This battery, except the large rubber jars which are made in accordance with the Standard Government Specifications, are entirely made and assembled by this firm. The grids used in this battery are of the Conventional design. The wood separators are carefully machined from



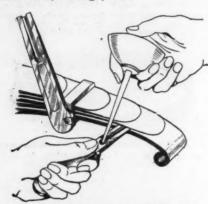
C & D Storage Battery

the best grade of cypress. The jars are inserted in strongly constructed wooden cases made of white oak, lock cornered and acid proofed.

The maker claims that because of the unusual rigid construction of the grid and the fact that they are hand pasted, eliminates any tendency to buckle, short circuit, or shed the active material.

Spring Leaf Spreader and Clip Bolt Wrench

A spring oiler for spreading and lubricating spring leaves and removing the spring clip bolts is a product recently offered to the trade by the Cochran Mfg., & Forging Company, 78th St., & Woodlawn Ave., Chicago, Ill.



New Cochran Spring Oiler The oiler is here shown holding spring leaves apart and also with the wrench end in use

One end has a wrench head for gripping the nuts and the other end is a ground and tempered wedge. This tool is steel forged, tempered, ground and polished on the surfaces. After the weight has been removed from the car, the wedge end of the wrench is forced between the leaves of the springs. Oil is then poured in the center of the tool which will run down a groove in the center to the end of the wedge and distribute itself between the surfaces of the leaves.

This tool is made in a 6-in. size and sells for \$.50 and a larger 8-in. size sells for \$.75.

World Combination Grease and Oil Gun

The World Manufacturing Company, Richmond Hill, N. Y., is in production with a new combination grease and oil gun with which parts can be lubricated through the smallest oil holes and which also can be adjusted to permit a rapid discharge of grease. This is made possible by the utilization of a spout which is provided with a special nipple.

The cylinder is made of heavy brass tubing. The plunger is fitted with a



World Combination Grease and Oil Gun
Has two cups with reinforcing washers and a
barrel of polished brass

double leather cup securely held in place by two heavy steel washers, so constructed as to prevent the passage of grease or oil back into the chamber from which it is being expelled. The combined action of a "screw down" type gun, or which produces a forceful pressure and the action of a "push and pull" type of gun, which is generally used for oils, is said to be produced in the World grease gun by the plunger thumb-nut construction. This product is made in two sizes, the small size selling at \$2 and the large at \$2.50 complete.

The Victor Decarbonizer Humidifier

V. R. Campbell, 75 Pennsylvania Ave., Elmira, N. Y., has recently announced a new humidifier known as the Victor Decarbonizer.

This outfit consists mainly of a pipe connecting into the intake manifold and radiator, to draw moisture from above the water lever and the radiator top,



Victor Decarbonizer

This shows the installation of the Decarbonizer on top of the radiator, and the connection at the manifold

down to the intake. This pipe is attached so that it is as near the radiator cap as possible, in order to eliminate the possibility of drawing water. This pipe is 40 in. long and 3-64 in. in diam. This device is claimed to keep carbon from forming in the engine and improve the running in general. Spark plugs are less apt to foul with this device attached.

The retail price is \$3.50.

RKM Transmission-Driven Tire Pump

Simplicity and efficiency in both construction and operation is the keynote of the new RKM pump that is being brought out at this time by the Ruggles-Klingemann Mig. Co., Salem, Mass.

The method of taking in air for compression under atmospheric pressure and partial vacuum caused by the down stroke of the piston, enables the cylinder to be completely filled with air under partial compression before the pump starts to mechanically compress

the air. By this means the full value of the cylinder arear is obtained. It is a well-known fact to aerologists that it takes three times as much to raise the pressure from 40 to 80 lb. as it does to pump from zero to 40 lb. This condition is due to leakage and back pressure and the inability of valve pumps to function properly, which is claimed not to exist in the RKM pump. The patented asbesgrapho piston ring takes care of the cylinder lubrication and a specially prepared graphite mixture in the crankcase completes the system of lubrication. The cylinder and piston of this pump are cast of gray iron.

The crankcase is packed with a special graphite grease which takes care of the piston and crank throw. A locking device locks the shifting gear in the housing in place, without the use of outside springs or ball cranks.



RKM Air Pumps for Trucks
Designed to be driven off the transmission

Fifteen ft. of braided air tubing, complete with hose connection and pressure gage is furnished as standard equipment.

Park-Lite Storage Battery Economizer

The Park-Lite Storage Economizer offered to the trade by the Mirror Park-Lite Corporation, 208 W. 17th St., New York, is designed to conserve the electrical energy that is consumed while the truck is parked. This conservation will incidentally lengthen the life of the battery.

This device consists of a lamp that is attached to the left-front mudguard, which shows a white light in the front and a red light in the rear. When the truck is idle the regular lighting system is shut off permitting this one light to serve the purpose of the entire system.

A Light That is Also a Mirror

This Park-Lite serves the two-fold purpose of a light at night and a mirror in the daytime.



New Ohmer Magnetos for Motor Trucks

A NNOUNCEMENT is made of a complete line of magnetos for trucks by the Recording & Computing Machines Co., Dayton, O., which concern has completed laboratory and road tests which extended over a period of two years. Two different types of magnetos are offered the truck manufacturer, these being designated as the AX-4 and C-4. They differ in that the AX-4 is of the conventional vertical type whereas the C-4 is horizontal. There is also a difference in the spark range, the AX-4 having a range of 35 deg., whereas the C-4 has a range of 45.

Hot Spark at 30 R.P.M.

One of the several advantages claimed for the Ohmer magnetos is that a sufficiently hot spark to ignite the mixture is obtained at 30 r.p.m. Use of an impulse starter is said to be unnecessary because of the efficiency at low manual cranking speeds, but the company is manufacturing an impulse starter of improved design and will supply it with its product should the manufacturer demand it.

The fact that truck dealers in undeveloped territory are called upon to service magnetos has been taken into account and careful consideration has been given to simplifying the construction and to interchangeability of those parts which may require replacement or attention. This is particularly true of the windings or center piece.

Removable Center Piece

To replace damaged windings it is not necessary to entirely disassemble the magneto and remove the armature, as the center piece can be displaced by the truck dealer's mechanic or the truck owner for that matter. The center piece can be dismounted with a screw driver, a new unit installed very quickly and easily, and without magneto repair experience as the part can only be replaced correctly.

The advantages of this construction are obvious. It eliminates retiming and



The BX, a Double Spark Four-Cylinder Magneto and Similar to the AX All AX types can be changed from a four to sixcylinder and vice versa by using new distributor and armature gears

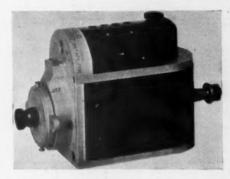
adjusting of the armature and avoids the design, constructed of the very best mapossibility of altering the center distance.

The replacement can be made quickly and at a minimum labor cost to the owner. In stocking spare parts the service station is not obliged to carry a complete armature.

The replacement can be made quickly to meet stated requirements. It is accessible and easily replaced. An interesting feature of the Ohmer design is the method utilized to provide a return path for the return current at high speeds.

Interchangeable Features

The breaker or interrupter mechanism is the same on both types and the parts are interchangeable. The material and workmanship are high grade throughout, and one of the features of the breaker is



The Ohmer C-4 Magneto Which Differs From Conventional Practice in Many Respects

The magnets are horizontal and use is made of an elliptical breaker cam. The cables are locked by a screw, and their insulation does not have to be stripped to obtain a perfect electrical concettion. Direction of rotation can be easily and quickly changed from clockwise to anti-clockwise or vice versa and without disturbing timing.

that it can be changed from clockwise to anti-clockwise or vice versa. This is accomplished by removing and reversing the position of the breaker arm carrying the movable contact point, and by placing a small coil spring on the opposite side of the stud or block carrying this member. The spring is retained by a screw. The interrupter or cam housing is provided with right and left hand connections.

Elliptical Breaker Cam

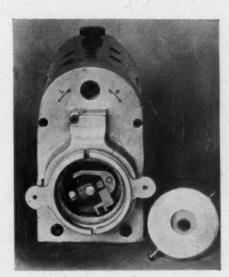
Wear and hammering action on the contact points is reduced to a minimum by use of an elliptical breaker cam and the fact that the breaker lever bearing is so designed that the opening between the contact points is parallel in any gap adjustment. Claim is made that there is little if any arcing at excessive high speeds. Adjustment of the gap is by the conventional screw type contact, locked by a nut. Due to the design, the adjusting member is readily accessible.

The Ohmer magnetos are constructed with one-piece housings, including laminated pole shoes. The armature is an example of high-grade workmanship and is finished to very close limits. The laminations are riveted together. The special construction, coupled with a new process of winding and high speed control, is claimed to eliminate the possibility of burning out. The condenser is a special

design, constructed of the very best material, and each is very carefully tested to meet stated requirements. It is accessible and easily replaced. An interesting feature of the Ohmer design is the method utilized to provide a return path for the return current at high speeds. Another novel feature is the making use of a screw in the interrupter disc as a holder for a carbon brush. The interrupter mechanism is attached to and revolves with the armature shaft as in conventional practice. The safety spark gap construction is not only sturdy, but well designed. The magnet material is tungsten chrome.

Time and Labor Saving Terminals

Standard terminals are used on the AX type, but on the C-4 or horizontal magneto, which makes use of very small distributor gears, and has the distributor and carbon holder in one piece, it is not necessary to remove the insulation from the cable or scrape the wire to obtain a perfect electrical contact. All that is essential is to cut the cable off square. insert in the orifices in the distributor and tighten the screws. This anchors the cable securely and obtains a moisture proof connection. The screws are a special taper and tests made by the writer at the factory failed to displace the cables and even when considerable pull was exerted on them,



Front View of C-4 Magneto Showing Breaker Mechanism

Note the observation window and numeral, also the elliptical cam and absence of conventional flat spring actuating movable contact point

The cable openings are numbered and the locking screws are exactly opposite the orifices which are parallel with the distributor. Cables can be cut, inserted and locked in a few seconds, effecting a saving of time in factory assembly as well as in the repair shop. Timing of the magneto is facilitated by a small window in the upper part of the rear housing and directly over the interrupter, a numeral

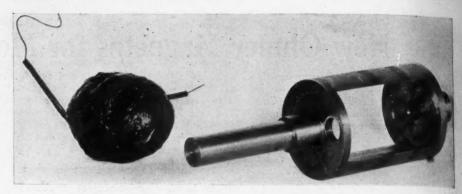
indicating the location of the distributor. Arrows on either side of this window indicate clockwise and anti-clockwise rotation of the distributor.

Compact and Light in Weight.

The base of both types conform to S. A. E. standards and the shaft dimensions are adaptable to any make of engine. The AX-4 weighs about 12½ lb., the C-4 about 11 lb. Both are moisture and dust proof. The C-4 is 6½ in. long, 3 wide and 5 high. It is stated that owing to the design and construction of the field and armature the spark on the timing range can be increased to 50 deg. if desired. The AX-4 is regularly supplied with a spark range of 35 deg., or if required with a set spark. The regular range of the C-34 type is 45 deg.

With the Ohmer AX vertical types it is possible to convert a four-cylinder magneto to a six-cylinder, or vice versa, by using a new distributor and armature gear. The same housing and distributor shaft bearing are employed due to an ingenious arrangement of the latter. All parts with the exception of the gears referred to, are interchangeable.

Among the laboratory tests made were 4000 continuous hours, 4200 r.p.m., safety spark gap 2 millimeters; 2000 continuous hours, 2800 r.p.m., safety spark gap



The Armature Winding and Armature Shaft Ends and Core Complete

The former is specially wound and can be removed without disturbing armature. A new one
can be installed without retiming instrument

5 millimeters; 1000 continuous hours, 1600 r.p.m., safety spark gap 7 millimeters. It is stated that there were no magnetic line losses, that the condenser and armature were in the same condition electrically as at the start and that the breaker arm lever and contact points showed no excessive amount of wear.

The Recording & Computing Machines Co. is well equipped for large production and during the war employed over 8000 persons in the production of anti-aircraft fuses, panoramic sights, telescopes, aiming circles, elevation quad-

rants, etc. The designing engineer has been identified with the magneto industry since its inception and has been connected with a well-known company abroad. The Recording & Computing Machines Co. is planning a quantity production of a complete line of ignition lighting and starting equipment for trucks and passenger cars, as well as ignition for airplanes and stationary engines. The policy is to incorporate the best of material and workmanship. Will I. Ohmer is president and Robert F. Ohmer director of sales.

The Trend of the Times

A recent development in the motor truck industry, which shows the trend of things toward automotive transportation more clearly than anything else could possibly show it, is a recent arrangement perfected by one of the country's oldest and best farm wagon manufacturers.

For seventy-five years the name "Milburn Wagon" has been a household word throughout the United States. The house of Milburn has been noted for its honorable dealings and for the quality of its product, which is well-known to farmers both in this generation and in the past.

It will be news to many who have bought Milburn wagons to read the announcement that the Milburn Wagon Company has decided to enter the motor truck field, and that the truck which they will handle in the future is the United States.

The following statement which they have just made relative to their reasons for this action will be found of interest.

"Vehicle manufacturers 'who think things through' have already realized that the motor truck has supplanted the heavy horse-drawn wagon for use outside the farm. Today the farmer is thinking how he can make use of motor truck transportation.

We believe the vehicle and implement dealer who has sold wagons to the coalman, the contractor, the farmer, is the logical distributor of motor trucks. Business is done on confidence and who more firmly holds the confidence of the business public and the farmer than the implement dealer?

The Milburn Wagon Company has contracted for the wholesale distribution of U. S. trucks, made by the United States Motor Truck Company of Cincinnati, Ohio, Michigan and Illinois. This decision was reached after a careful survey of the truck field, and the choice was made because of our faith in your company, its financial responsibility, the moral worth of its executives and directors, and, not least, because of their twelve years' experience in building motor trucks. Also, because our own engineers had pronounced the design and equipment of U. S. Trucks as being in line with our ideas of what a truck should be were it bearing the name of "Milburn", and because your concern has had the adequate capital and foresight to stock materials sufficient to insure steady production and reasonably prompt deliveries.

Milburn believes there is a lot of this truck business for you right in your community and backing this belief we are yours to command."

Nothing could more clearly demonstrate to the mind of the farmer and of the manufacturer as well, that motor truck transportation is a real necessity. Much has been written upon the subject of the motor truck and its uses upon the farm, but the fact that one of the foremost wagon builders in the country has taken this step is complete evidence of the ascendency of the motor truck in the field of transportation.

Denver to Banish Horse

DENVER, April 5.—An ordnance is before the city council, which if passed will banish from the streets of Denver after January 1, 1925, all horses, cattle, sheep, and swine, it forbidding the keeping or the driving of these animals within the corporate limits of Denver.

"On Time" Car Buyers Financially Strong

Incomes Averages \$275 Monthly

The buyer of an automobile on time is a stable member of the community, a property owner, with legitimate uses that make his automobile a necessity. The buyer for cash may be a joy-riding flyby-night.

Such are the conclusions to be drawn from figures compiled by the statistical division of the General Motors Acceptance Corporation, the largest exclusively automobile financing company in the country. The low average of 56.2 per cent of the sales price for the note, when 66 2/3 per cent of price could remain on deferred payment, and 75 per cent of the sales price of commercial cars is shown, indicating that buyers did not take all the time and money they could get, but only enough to satisfy their needs.

As mentioned in polite but uninformed society, the man who buys an automobile "on time" is a spendthrift joy-rider turning his pockets inside out, impoverishing himself for months that he may whirl about the country endangering his own and other's lives.

As shown by the General Motors Acceptance Corporation statistics, the man who buys "on time" is a conservative property owner, with assets and an income that amply entitle him to credit in making purchases, and who finds an automobile a necessity. He is over 35 years old; he has over \$6000 real estate; he has over \$275 a month income; he buys a \$1044 car; he pays 44 per cent in cash; then he pays 56 per cent in ten months, and his monthly payments average only 20 per cent of his income.



Get Most Miles Per Dollar By Adopting This Giant Combination

The Firestone Giant Cord with its greater cushioning protects the load and the truck under every ordeal of rough travel.

Changes are made quick and certain with the Firestone Detachable, Demountable Rim.

And the Firestone Giant Red Tube gives added security every mile on the road.

FIRESTONE TIRE & RUBBER COMPANY
Firestone Park

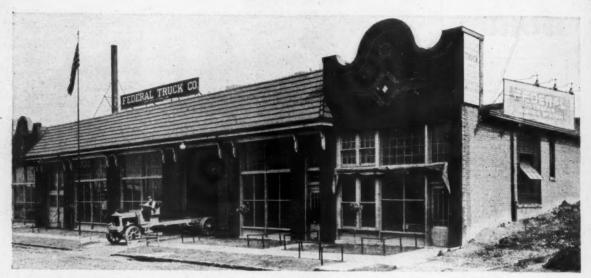
Branches and Dealers Everywhere



An Efficient Service Station is a Big Factor in Building Up Truck Sales

Motor Truck That Enters Station Can Get Everything. Nothing Overlooked That Will Put Speed Into Work Going Through Shop

By A. V. COMINGS



Front View Federal Truck Co., Forest Park Building, St. Louis. It Covers 30,000 Square Feet

VERY motor truck dealer or distributor who is worthy the name realizes that the continued growth of his business depends in a very large measure on the kind of service he is able to give users of the truck he sells. Whether he has five or five hundred trucks of his particular make working in his territory, he must be able to give service. Service that will guarantee every owner a maximum of returns by keeping his truck in operation when there is work to do. Unless the dealer is able to give this kind of service, he will find that repeat orders from owners are very hard to get, and that his salesmen find it hard to prove to new prospects that they will be able to get maximum service from their machines in the event that prospect buys this make of truck. The influence of the service department on the results achieved by the sales department is a detail successful truck dealers are not overlooking these days.

Service is Keynote

The Federal Truck Company, of St. Louis, is a shining example of what a successful motor truck distributor provides in the way of service, and the fact that there are over 500 Federal trucks working in the St. Louis territory, and that they are kept working day in and day out, is very good evidence that a first class service department is worth while.

The one central idea around which service is built in this establishment is that the motor truck that comes into the place for repairs must be turned back to the owner, with repairs completed, in the quickest possible time consistent with

good workmanship. There is constantly drilled into every employee the thought that motor trucks are, above all else, an investment for earning money for their owners, and the only time they earn money is when they are in action. Therefore, it is to the interest of every employee of the Federal company to keep them fit for action.

The work of the Federal service station is thoroughly departmentized, and each department is in charge of the best man that can be found for the particular work.

Complete Supply of Parts

As any first class service department is dependent primarily on a complete supply of repair and replacement parts for its usefulness, the Federal company has made this part of its service complete. Nearly \$50,000 worth of parts and service material is on hand at all times, and the department in which this is kept is located just within the entrance doors, with shelving and bins loaded with parts in plain view through the large plate glass windows forming the front of the building. Showing a prospect this plentiful supply of parts on hand is a very good sales argument, and one that is often used, for it tells him better than promises just what the company can do for him after he has purchased his truck.

Keeping track of this big supply of parts, covering many different models of trucks, is easily done through a card index system. A copy of the card used is shown herewith. These cards are what are known as "three cut cards," as they are printed similarly on each side and the index tab is so located that by using three different cuts of cards five differ-

ent positions of the index tab may be obtained by reversing two of the cards. This saves money in ordering. These cards were illustrated in connection with the Federal Service Station article in our December, 1919, issue, page 106. These cards were described in that issue in detail.

The stock room is also used as a tool room, and every mechanic who takes a tool from this room is charged with it, so that there are no "lost" tools around the Federal service station.

The machine shop is as complete as money can make it, for it is the aim of the Federal company to do all of its own machine work in Federal truck service. It is equipped with a full complement of lathes, drill presses and the other machines usually found in a motor repair shop, together with a cylinder grinding and piston grinding machine. So complete is the machine shop that much work is brought in from other garages and service stations. This work is taken care of whenever it does not interfere with Federal work on hand. The machine shop, like all other departments, is partitioned off from the rest of shop.

Every Detail in Equipment

A special motor repair shop is located on a balcony floor at the rear of the shop, with a trap door in the floor directly underneath an overhead trolley track, from which depends a chain hoist. A truck from which the motor is to be lifted for repairs or overhauling is pushed under the trap door, the chain hoist is attached, and the motor is raised to the balcony floor with a minimum of effort. The trolley track and chain hoist enable one man to take the engine from the truck and transfer it to a Manly en-





Easy Steering Increases Efficiency, Reduces Delivery Costs, Makes Satisfied Owners

The real efficiency of a motor truck depends very largely upon the ease with which it can be handled. This is one of the most vital of all considerations for the man who buys a truck, or for the manufacturer or dealer who sells it. Ease of handling, in turn, depends essentially upon the steering gear with which it is con-

Ross Steering Gears, with their enormous bearing surfaces, mean an easier day's work for the driver, and at the same time a bigger return to the employer in greater service from both the truck and the man who drives it. This increased efficiency reduces delivery costs and makes satisfied owners.

In order to insure their customers of the easy steering, the safety and the reliability which Ross Steering Gears guarantee, 166 motor truck manufacturers are now using them as standard equipment. They know that Ross Steering Gears mean contented drivers and satisfied owners.

Write for any further information desired

ROSS GEAR & TOOL COMPANY

760 HEATH STREET, LAFAYETTE, INDIANA, U. S. A.

he Steering ars that Predominate on Motor Trucks



View of the Engine Repair Shop Which is Located on the Balcony Engines are lifted from the ground floor by a hydraulic hoist through a trap door

gine stand, of which there are several on this floor, where it is ready for whatever work there is to be done on it. In the engine stand, which is on casters and may be moved from place to place, the motor may be placed and held in any position. This not only facilitates accurate and rapid work, but also enables the repairman to work in more comfortable positions.

Long benches, with drawers beneath, and complete tool equipment, make the engine repair department efficient in every way. One piece of machinery that has proved well worth while in this department is a test stand, "home made," for motors after overhauling. This stand was also illustrated in our December issue.

A feature of Federal service in St. Louis seldom found in shops of this character is the welding department, which is given a separate room, fully equipped with the most modern appliances for doing good work. Three large welding tables are provided, so that in rush times work may be in process of "setting up" on two while the actual welding work is being done on a third job. This makes rapid work possible. Provisions are made for thoroughly preheating all heavy work with ordinary illuminating gas, supplemented by an air blast, as this has been found to be not only very economical, but makes for much better welding results.

The Federal company has found it not only an excellent idea to have this welding department for its own work, but has also put in a stock of welding supplies, which are sold to other welding shops in the St. Louis territory.

A complete solid tire department cooperates with the other departments because, when the truck is being mechanically overhauled, worn out tires may be replaced at the same time without consuming any more of its valuable time than would ordinarily be taken up in the mechanical work. The tire department carries a complete stock of all sizes of solid tires used by Federals, and is equipped with a 200-ton Wellman-Seaver-Morgan hydraulic press for changing tires

The Federal station is equipped, of course, with wash rack, locker rooms for the men, and all the other smaller details that are to be found in modern service stations where efficiency and good work go hand in hand. Both night and day crews are maintained to hurry out rush work.

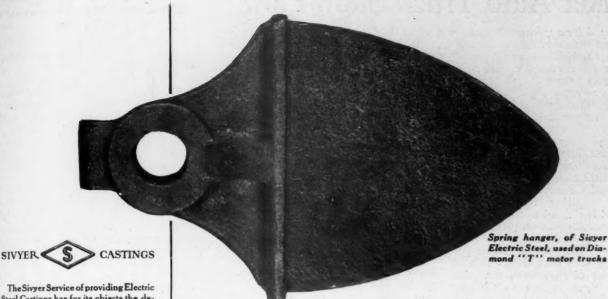
The method of handling work through the repair shop is similar to other shops of this character, although some details are particularly worth mentioning. Each workman has to ring in and ring out on each job, on a time clock, and if he is on a dozen different jobs during the day, his card will show the exact time spent on each. No argument there. All work orders, copies of requisitions, data of all sort pertaining to a job going through the shop, are placed in one big envelope bearing the number of the job, and as a result the entire record of the work is in one place, easily found, in the event of a dispute of any kind arising over the work or prices charged.

On repair and service work, as on every other detail where orders are required in the Federal service station, "verbal orders don't go," with this company. Verbal orders often lead to disputes, and the question of "you said this" or "you said that" is never susceptible of proof. Therefore every order in the Federal station is written on small order blanks, with a carbon copy retained, and there is no room for dispute. The order is right there in black and white. This is an excellent idea.

One other detail that has proved worth while in the Federal service station. On small record holding boards, all hinged at the same point perpendicularly so that they may be moved like the leaves of a book, is kept a complete record, as far as possible, of every Federal truck in St. Louis. On this record appears the name of the owner of the truck, his address, the size of the truck, type of body, and the date of sale and dates on which it has been in for service of any sort. If the truck passes on to another owner, this data is entered also, when obtainable. This truck record is kept by the shop time clerk, in spare times, and is invaluable in many ways.



The Welding Room is Equipped With a Full Complement of the Most Modern Appliances



The Sivyer Service of providing Electric Steel Castings has for its objects the decrease of machining costs and the increase of wearing quality and life. Both are attained by methods which result from long experience and begin with the design of the casting itself. When we find that a casting we are asked to furnish is of a design not consistent with good foundry practice, we study its function in the completed unit and offer the necessary suggestions to make it a really practicable casting job without affecting in any way its function and efficiency.

Secondly: Sivyer Service analyzes the functions of the casting and specifies the proper composition steel for the job; long experience with carbon and alloy steels has enabled us to reduce costs and increase quality remarkably for many different industries.

Thirdly: Sivyer Service makes a careful study of the pattern and molding problems involved, for improper gating and insufficient risers are often the greatest wasters of machining labor and metal.

Fourthly: Sivyer Service analyzes carefully the proper annealing methods to be used and controls their proper application through unfailingly efficient equipment and men. In short, the Sivyer Service supervises every step necessary to secure unusually and unfailingly good castings of electric steel. It never relies on one factor alone, relies very little even on the natural freedom of electric steel from occluded gases and on its commonly recognized merit in resisting crystallization. It also depends but little on the inherent scientific accuracy of the electric furnace process. From castingdesign to sand-blasting and tumbling, the fundamental superiority of Sivyer Steel is due to its men and metal. Their value is best proved by the fact that, although the production of steel castings is generally looked upon as a local one, the Sivyer market is national.

OF the 350,000 motor trucks to be built in 1920 many will have castings of Sivyer Electric Steel, not only for the hardused parts, where exceptional toughness and freedom from crystallization is an essential, but also for the more minor positions. This is one of the ways in which alert manufacturers are fulfilling the public demand for a more stalwart and longer-lived truck chassis. The Diamond "T" Motor Car Co., for example, is using six parts of Sivver Steel because its extra strength and wear resistance carries to the purchaser of their trucks an unrivaled guarantee of sustained performance and long life. An increasing number of automotive manufacturers are using Sivyer Castings as an added sales influence and as insurance of satisfactory service from their product.



Baker Auto Truck Snow-Plow

HE need for a quicker and cheaper means of moving snow from streets and highways to keep them open throughout the winter was unusually acute because of the unprecedented heavy snow falls throughout the country this past winter. The scarcity of teams and men was another factor that had made this need more urgent than previous years. This condition has resulted in the introduction of many snow-removing appliances of which the Baker Attachable Auto Truck Snow Plow is one of the most practical. It is produced by the Baker Mfg. Co., Springfield, Ill., and is claimed to take the place of from 150 to 200 men with shovels.

An important and distinctive feature of this plow is a patented hinged blade which when meeting with obstructions such as raised portions of pavements, manholes, etc., swings upwards and to the rear compressing vertical springs. Upon passing the obstruction the springs which are sufficiently tensioned force the blade to its original working position. Another important detail in connection with this blade is the fact that the longer blades are built in two or more sections so that the entire blade need not swing back when meeting with small obstructions and allowing an unnecessary amount of snow to pass under the blade. This also eliminates the possibility of a heavy thrust which might be injurious to it because it avoids the resistance of impact, that would ordinarily be transmitted to the truck.

This plow can be operated at a speed at from 3 to 10 m.p.h. depending on the nature of the surface cleaned and the depth of the snow.

Although the moldboard can be obtained in various heights the standard

height is 12 in., and the length varies from 6 to 10 ft. The blades which are of double beveled high carbon crucible steel are 6 x 3/8 in. They are detachable and connected to the moldboard by handforged hinges with compression springs in vertical position. The 31/2 in. angle circle has a series of holes through which a pin is dropped to adjust the blade to any angle to the direction of travel. The push bars are of heavy steel "T's", which are properly braced to insure rigidity. The plow is held in a firm position by hand-forged steel universal clamps which connect the push bars to the front axle of the truck. These clamps are easily detached. The shoes at the rear of the moldboard are adjustable and carry the weight of the plow slightly below the bottom of the blade to permit of the passing over of irregularities and to prevent undue wear on the blade. The plow can be raised off the pavement when going to and from work and when not in use by a compound lever.

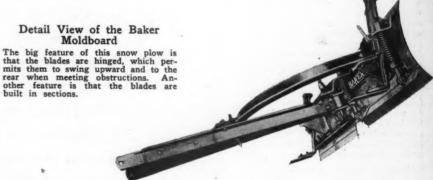
Comparative Costs Show 300 Per Cent Saving for Trucks in Mines

The Dixie Bee Line Company of Mortons Gap, Ky., which operates what is generally called a wagon coal mine necessitating a haulage of about a mile, made a net saving of \$18.43 per car when they changed from wagon to truck haulage.

"We formerly loaded coal with wagons," wrote G. E. Henry, secretary of the company, "and in order to get a true basis of costs, it would appear that the proper method would be to make a comparison between the wagon and truck haul. Considering that we load on an average of 50 tons per day on railroad cars, the wagon haul costs 60 cents per ton or a total of \$30 per car."

The truck haul figures given were as follows: Driver, \$4; gasoline and oil, \$3; interest on investment, \$.83; depreciation, \$2.60; estimated repairs, \$1—total \$11.43 as against \$30 for the wagon.

These records were made with a Federal two-ton truck over an ordinary dirt road crowned in part with cinders and part with a mixture of cinders and dirt. The



change was made while the war was on.

"The truck has been our salvation in the coal business," says Mr. Henry in part, "for the reason that the fuel administration had ordered the railroads not to furnish cars for the wagon mines and as consequence the wagon mines have been compelled to close down, but owing to the fact that we had the motor truck haul and were able to load promptly a car when it is placed for us, we got our cars along with the larger mines.



Manner in Which the Baker Plow is Attached to the Front of the Truck
The plow can be easily detached when not needed

Transport Truck Distributors Meet

The larger distributors of Transport motor trucks recently met at the Transport Truck Company's new factory, Mount Pleasant, Michigan. Although Transport has been manufacturing a little more than a year, these distributors came from all parts of the United States. Among them were some of the most prominent men engaged in the marketing of trucks.

The immediate reason for meeting is the fact that the Transport Truck Company is bringing out a new truck for 7000-pound service.



We Sold 8 Big Atterbury **Trucks**

In 2 Hours and 10 Minutes

TO THE FOLLOWING:

J. J. McHALE, heavy hauling contractor, Paw'tucket, R. I., one 5-Ton Atterbury Dumn.
Repeat order.
METROPOLITAN WHOLESALE GEOCERY,
'Providence, R. I., 1½-Ton Atterbury. Second
'truck we sold them.
WM. B. BUCKLEY, general trucking, Pawtucket,'
R. I., 3½-Ton Atterbury. Repeat order.
PROVIDENCE ASH CO. (John Keyes), city, 3½Ton Atterbury.

J. P. MARCHINGTON, Newport, R. I., 24-Ton Atterbury.

NEWPORT PAPER CO., Newport, R. I., 244-Ten Atterbury. Repeat order.

McCRAE & MAGNAN, Pawtucket, R. I., 31/2-Ton Atterbury. Second truck we sold them. Atterbury. Second truck we sold them.

DANIEL ROSATTI, heavy hauling contractor, Oak street, Providence, R. I., 3-Ton, Atterbury dump. Repeat order.

The Reason Why So Many Local Firms Are Buying Atterbury Trucks-

is a simple one. It's not because they cannot get other trucks. There are over twenty dif-ferent makes of trucks on sale in Providence. It's because

The Atterbury Offers Greater Value Per Dollar Than Any Other Truck on the Market

And the Atterbury leads in economy. Its first cost and after cost is remarkably low. Atter-bury trucks cost from \$500 to \$1500 less than other trucks of similar units and capacity.

Every day stuff for Atterbury dealers

THE advertisement shown at the left was recently run in a newspaper by an Atterbury dealer (name on request).

And then a few days later, from the same dealer, came the following wire-

"Please advise by wire number of trucks and models can have during next ten days."

Any, Atterbury dealer will tell you this is "everyday stuff."

The Atterbury franchise is one of the most valuable in the entire industry, because Atterbury sales are built on a record of satisfactory service over a period of more than ten years.

ATTERBURY MOTOR CAR COMPANY, BUFFALO, N.Y.



Senator Townsend Explains the Federal Highways Bill

Provides Efficient Management

ASHINGTON, D. C., April 10.— Senator Charles E. Townsend, of Michigan, introducer of the Federal Highway Bill, comupon the measure as it now stands rewritten, and before the Senate committee on post offices and post roads. The "Federal Highway Bill creates a commission of five men to be nominated by the President and con-firmed by the Senate, and selected from different sections of the country. terms of the commissioners are for five years and their salaries \$10,000. They are to engage in no other business, but must devote their entire time to their duties as commissioners. It is believed a commission would be better than the present highway division of the Department of Agriculture.

"The commission shall establish, construct, maintain, improve and regulate a national system of highways, comprised of connecting interstate roads which shall be the most practical routes and with due consideration for the principal centers of agricultural and industrial production, afford ingress into and egress from each state and the District of Columbia.

"This system may include highways to and from important water ports and highways connecting at international boundaries.

"The commission shall consult with the state highway authorities as to routes which shall be followed.

"The proportion of the national highway system in each state shall equal one per cent of the total highway mileages actually used in that state.

"In any state, however, where said one per cent would not afford two highways connecting with national highways in adjoining states or to principal water ports, the commission shall increase the mileage in such state sufficient to provide two such highways. If any state shall have already built any portion of a highway selected by the commission to a standard which shall meet with approval of the commission, such state shall be allowed by the commission the present value of such constructed highway, such allowance to be invested by the commission or by the state in other roads tributary to the national system in the state. The road thus taken over by the commission will be thereafter maintained by the commission, but the state tributary road will not thereafter be maintained by the commission.

"The states must consent to the taking over by the Federal Government of such of their roads and rights of way as may be required for the national system.

"The bill provides for rights of way across public lands and for the use of road materials on public lands.

"Only durable types of roads and ma-

terial shall be built and used. The kind of material used in any general locality must be determined by the needs and condition of such locality.

"The bill takes from the secretary of agriculture and from other Federal agencies all authority on highways and transfers them to the commission with all personnel and equipment.

"The states retain all civil and criminal jurisdiction over persons and property upon the national highways, and the rights and duties of the inhabitants with respect to the use and enjoyment of such highways are not abridged.

"The bill carries an appropriation of \$425,000,000 carried over five years. The first year \$50,000,000, second \$75,000,000 and \$100,000,000 annually thereafter for three years.

"It will start the United States on the right road to highway construction and will at the same time be a benefit to the states such as they have never experienced. The time has come when system, not haphazard wasteful methods, should be employed in road building."

As Congress approaches definite action upon the measure a few highway officials and others in some states are expressing opposition on the ground that the act proposes to take over all highway work as a Federal function, and that Federal aid as now operating will be jeopardized. It is even reported that the impression is being created that even state highway departments will be eliminated.

Senator Townsend calls attention to the fact that the National Highway Act does not propose to supersede the Federal aid plan, but seeks to extend that plan, and go even farther in helping the states work out their highway problems by taking over as a Federal burden the construction and maintenance of such routes in each state as may be designated as links in a national system, the percentage of a national system in each state being about one per cent of the state mileage.

Plans of American Railway Association Approved by N. A. C. C.

The proposed railway bill, and the plans of the American Railway Association for greater efficiency in handling the shipment of automobiles meets with the approval of the N. A. C. C., and the latter's representative has been in Washington in conference with the car section of the American Railway Association. Individual railways will sign agreements giving plenary power to the Interstate Commerce Commission as to the general control and distribution of cars, or any particular group of cars.

Makes Bad Roads an Asset

"I strive to make bad roads an asset instead of a liability in selling motor trucks," states William Drummond, salesman for C. U. Williams & Son, of Bloomington, Ill. "I have heard salesmen bemoaning the handicap they labor under when located in territory where good roads are unknown and where the first note of opposition relates to the condition of the highways and the skepticism concerning the ability of a truck to operate at all seasons of the year. I claim that a truck is a twelve-month proposition. regardless of the roads, and I further maintain that a truck will haul a load wherever a team of horses will. However, I believe that truck salesmen should not exaggerate the power of their machine nor make any rash claims concerning its capacity where the roads are bad. I maintain that the salesman, to be successful, must gauge the load upon the truck to the condition of the road and not make the mistake of trying to haul full or nearly full tonnage when the highways are heavy. I reason with a prospect that he graduates the load for a team of horses in proportion to the condition of the road and their ability to pull it. Is it not equally fair to make the same concession for a truck? The same proportion of economy will hold good, whether the roads are good and permit full tonnage or they are heavy and force a reduction. I am willing to make a demonstration with the truck I represent upon any road, but I will not overload. I hold that the salesman should use judgment and regulate his tonnage in accordance with the condition of the highway, and being ready later to prove full tonnage when the roads Many truck owners make the dry up. mistake of overloading their machines in bad weather and are unreasonable in expecting just as good service as when the roads and weather conditions are ideal. They should learn a lesson and reduce this gradually as the temperature lowers, while it is cut in two when there is snow fall. The chief dispatcher has full authority to regulate the rating, and studies the weather conditions at all seasons of the year. Even a gale of wind, which has a tendency to retard a train, is respected and a reduction in the number of cars is ordered. Let the motor truck salesman use the same argument and welcome demonstrations upon bad roads instead of keeping in the background with his truck until sunshine comes and the mud disappears. Here is Illinois, we have bottomless roads for a few weeks during the winter season, but I am ready to show what a truck can do under any conditions, and I can trace many sales to my theory that bad roads can be utilized as an asset instead of a liability."

> Our Next Issue will contain interesting information on Motor Truck Hoists. Every dealer should be thoroughly conversant with this subject

To Established Motor Truck Dealers

A NEW type of gasoline-propelled industrial vehicle of proven ability for haulage in and around industrial plants is to be marketed. The producing manufacturer is well-established and in position to offer prompt deliveries. The vehicle is now in production and in successful use with many leading industrial concerns.

The territorial selling rights are now open only to a number of <u>established</u> dealers—those who are financially able to control desirable territory in industrial centers and develop a live selling organization.

Complete details may be had by addressing the Chilton Company, Market and 49th Streets, Philadelphia, Pennsylvania, who vouch for the reliability of this advertisement and the responsibility of the advertiser.

Address XYZ, Chilton Company 49th and Market Streets, Philadelphia, Pa.

What Are You Dealers Going to Do About It?

THIS past winter has demonstrated the value of the truck as it has never been demonstrated before. People knew what the truck did to win the war, but many people were skeptical in regard to what it could actually do in winter weather. It required an actual demonstration to convince these people.

The worst storm of the winter, which was the worst storm for years, was followed by such items in the papers as follows

"While street car service was suspended in some of the outlying districts coal deliveries were made by many companies whose men stuck to their trucks."

"The railroad had not been broken out up to noon. No train had been run over this branch since 9 o'clock yesterday morning. In consequence no mail had been received by any of the post offices served by this line for nearly 24 hours and the beef boxes in many of the markets which depend upon this branch for the shipments are running low. Up to noon the only provisions reaching here since the storm were brought in by two motor trucks, which had succeeded in breaking through the snow. One was loaded with bread and the other with pork products."

"Jitney busses were running as usual."
"Busses were making fairly good time this morning."

"Big drifts on a foundation of ice were immovable by the cars, and it was necessary to dig out the rails in many places."

The people in the community where the paper is published from which these clippings were taken are no longer skeptical. In some cases their very life depended upon the fact that motor trucks were able to get through when nothing else could. Many a person was able to get to work when trolley cars were not running and the busses were running.

Motor Trucks Prevented Many Shutdowns

Manufacturers who otherwise would have found it necessary to shut down their plants were able to keep going because of the service rendered by trucks. Perhaps, however, the greatest tribute to trucks comes from the trolley company itself. This company is now in the hands of a receiver. It is going through the process of reorganization. Various plans have been discussed. Up to the time of the storm the attitude taken by the company was that motor busses should be prohibited.

Since the storm new plans have been taken up, and in these plans it was suggested that a change be made in the charters and franchises which would permit the company to run motor busses. Had the trolley company been in a position to operate motor busses during the storm, it could have given far better service than it did, and it could have saved a vast amount of money. Service could have been given on lines that could not

be kept open for trolley service. On certain lines where the expense of keeping the tracks clear was very great, the busses could have been used for emergency and the expense of keeping the tracks clear would have been saved.

Never before had the trolley company officials realized the reliability and serviceability of the motor truck. Never before had they realized the possibility of using busses as an auxiliary to the trolley system. They have now gone on recard as to the possibilities of such a course. Already certain non-paying lines have been abandoned and the business turned over to the busses.

If the trolley company is given permission to operate buss lines itself, it will be in a position to abandon more unprofitable lines and replace them with busses, thus, not only making the traffic meet expenses, but at the same time giving so much better service that the buss lines will serve as worth-while feeders to the trolley system.

Busses are a Logical Auxiliary to Traction Lines

Another advantage will be avoiding much of the trouble that has been connected with the adoption of one-man cars. One-man cars only partly solve the problem of cutting down expenses. They save little more than the salary of one man. The overhead connected with the railway itself still goes on. Busses not only mean the elimination of the wages of one man,

but also to a gery great extent the overhead connected with the maintenance of way of the railway.

As time goes on street car company after street car company is going to see the wisdom of cutting down expenses and at the same time improving service by making busses a supplement to the regular trolley system. The buss has come to stay. This past winter has demonstrated that. It only remains for the trolley companies to decide whether they will make use of them or whether they will leave all this work to competitors.

Some street car companies have succeeded in having the running of busses in their districts prohibited. In doing so, instead of securing the privilege of solving many of their present very pressing problems.

Traction companies all over the country are facing very serious problems. One of the solutions lies in the adoption of motor busses on unprofitable lines and in most cases will be able to turn a deficit into a profit.

During the past winter motor trucks have demonstrated that they can give better and more reliable service than either steam or electric trains. On lines where neither of these were running trucks went merrily along. It is only a matter of time when traction companies will se the light. The sooner they do see it the better it will be for the companies, the public and for the motor-truck man.

Motor-truck traffic engineers have a problem here that is well worthy their serious consideration. Showing the traction company officials how the motor truck will solve their most serious problems will be a service that is really worth while.



One of the Latest 1920 Model Available Trucks Transporting Fuel

Note the sturdy construction of this solid tire equipped job, the heavy frame, the radiator guard, tow hooks, collapsible crank handle, flush side lamp on dash and the heavy designed body



Replacing Street Cars With Motor Buses

By Hon. GROVER A. WHALEN, Commissioner of Plants and Structures, New York City

ROGRESS is the legitimate issue of emergency. Certain trolley lines, crushed under the burdens of cost of tracks, conduits, power lines and equipment, plus watered stock, looted and mismanaged, ceased rendering to the public the service required by their franchise. Large sections of the public were blandly advised that they would have to walk. But they did not. They rode in buses. They paid the same five-cent fare and they were carried quicker. The "stand and deliver" policy of the traction interests had created an emergency out of which issued the successful introduction of the bus system in the City of New York.

The bus as introduced was a makeshift. Privately owned cars, such as could be picked up here and there, privately operated under public supervision, was at the time the only possible answer to the challenge. But even with types of buses not adapted to the needs of the traffic, better service was rendered the public than by the trolley cars laid up by the

But these buses blazed the way for the publicly owned and publicly operated bus that is to solve, not one, but many problems of the congested metropolis.

There are now operating on 10 routes, over 25 miles of public highways 170 buses, each carrying passengers at the same five-cent fare but twice as quickly as the abandoned trolley lines.

On September 21, 1919, the first motor buses were put in operation, under the supervision of the Department of Plants and Structures, on 48 hours' notice, the private operator to whom an emergency permit had been issued, having failed to supply service. Since then we have acquired a mass of experience out of which we have formulated and proved certain definite conclusions.

More Economical Than Street Car

The outstanding fact is that the motor bus is more economical than the street car. The fundamental reason for this is that the only capital charge is for the bus and garage. Just what this means may be illustrated concretely by comparing these facts;

The surface lines of the New York Railways Company are capitalized at \$503,374.32 per mile. The 25 miles of bus lines which we now operate can be equipped at an average cost of \$22,800 per mile. Squeeze as much water as you will out of the trolley line capitalization, and you still will have a figure more than ten times the cost of establishing a motor bus line. The reason is obvious. As against the cost of buses and garage—the only capital costs in motor bus operation—you have to create for a trolley line not only cars and car barn, but you have to lay down steel tracks, and you have

to run conduits under the tracks or wires overhead; you have to maintain the tracks and transmit the power, and you have to produce the power.

The bus system therefore has an economic advantage over the trolley system that makes it futile for the trolley to hope to stagger on under its heavy overhead burdens. A system that cuts its capital charge to less than one-tenth will succeed.

Moreover there is another economic advantage in that the motor bus is a one-man operation. Just consider the claim of the New York Railways Company that the labor cost of surface car operation a year ago was 86.56 per cent of its entire payroll, and that this labor cost took nearly half of each nickel fare. It is easy from this to see how important is the economic advantage of substituting the one-man bus for the two-man trolley car. So much for the purely economic phase of bus operation.

No Tie-ups in Traffic

What the New York public is now intimately concerned with is service rather than capital charge. In this respect the bus not only stands up against the trolley car, but it literally runs away from it. In short it gives quicker and better service. It is a matter of concrete experience that our bus lines have cut down the running time between given points from 20 to 50 per cent. What this means to busy New Yorkers cannot be overestimated. The idea in New York is to "get there." The bus gets you there while the trolley lags, halts, tarries. Five to twelve minutes saved on a trip that used to take 25 minutes means something definite and valuable to the people. Ten minutes saved in a day is equivalent to 61/4 working days saved in 300 working days. This illustrates what bus transportation means to the passengers.

There are reasons for this time saving that are apparent. A motor bus is not tied up by a block. If a trolley car breaks down the line is tied up. If a bus breaks down, the next bus wings up alongside, takes the passengers from the disabled vehicle, and goes on its way. If a street is closed by an accident, a fire, a parade, the trolley line is tied up, but the bus swings around the block. So much for economy and service.

Bus Accommodates Itself to Traffic

The street car, operating on fixed tracks, is the basic cause of this condition which costs the people of this city unaccountable millions in loss of time and in increased costs due to the slow movement of merchandise. The traffic has to accommodate itself to the trolley car, and the trolley car in turn is impeded by the traffic owing to the fixity of its own course.

In contrast with this rigid, unaccommodating system, the motor bus is a flexible

operation. It adjusts itself to the traffic, swings around a slower vehicle, is not impeded, and does not impede. It speeds up the traffic, instead of hindering it. The motor bus requires no tracks. This would reduce the wear and tear on other vehicles, and diminish the number of accidents.

Loading and unloading at the curb, the motor bus would remove one serious cause of congestion—the constant stopping of streams of traffic caused by the loading and unloading of trolley cars in mid-street. This, too, would have an important effect in eliminating a frequent cause of accidents by removing the necessity of people braving the current of traffic by going into the middle of the street to get on a car.

Safety Zones Would be Eliminated

The danger, under the trolley system, has necessitated the setting aside of safety zones on the streets. With the trolley system eliminated and buses in operation, these zones would be unneeded, and these spaces would be restored to the roadway for the use of vehicles.

Motor bus operations, under public ownership and operation, will be doubly profitable to the people of the city. It will preserve to them transportation for a five-cent fare, saving the extra cents or nickels demanded by the traction interests for service over their slower and uneconomic lines. It will, moreover, earn profits for the city, and thus supply funds for needed municipal purposes which would otherwise have to be provided by taxes.

To demonstrate this point, let me cite these facts:

The city can purchase 100 motor buses with extra parts and garage equipment for \$570,000.00.

The fixed charges, including liability insurance, interest, depreciation, and a force of 220 employees for one year will be \$635,000.00.

With 92 buses in operation and 6 in reserve, the 10 lines can be operated at a cost per day of fixed charges, \$1,740, cost of gasoline, oil and tires, \$683.20, or a total of \$2,423.20.

These lines are now carrying 75,000 passengers a day. Counting 60,000, the fares at 5 cents would be \$3,000.00.

Showing an average daily profit of \$376.80, or an annual profit of \$137,532.00.

For the purpose of this point, I have taken the well-tested figures based on the actual experience of this department, and on careful estimates purposely made high on cost and low on returns. I have taken as a unit comparatively small operations with which we are familiar, and on these operations, I confidently estimate a net profit of \$137,532.00 per annum.

These lines, remember, replace the trolley lines that the companies regarded as most unprofitable. When we begin to

Motoring is increasingly delightful when ball bearings working on steel balls cushion those discomforting jerks and silence friction's noises.

Constant vigilance in research and manufacturing, by Hoover Engineers, has produced such perfect roundness and fineness of finish in Hoover Steel Balls, that they contribute immeasurably to the nation's motoring comfort.

HOOVER STEEL BALL COMPANY Ann Arbor Michigan





operate other lines, along routes that the companies find more profitable, we may expect even larger profits, and each new line will help to swell the total of net earnings until by bus operation the city will be able to reduce the tax rate and lighten the burdens on real estate owners and on rent payers.

It must seem evident from these facts that the motor bus offers the answer to the higher fare propaganda. That answer is not "ten cents" nor "eight cents" nor even "six cents," but the same old belittled nickel. The nickel has been squeezed, as the "Subway Sun" pictures it, but when it comes to surface transportation, the thing to do is not to take two nickels for the service one nickel has been buying, but to give a service that can be rendered profitable for the nickel-a better service, that is, a bus service.

In conclusion, let me say emphatically that the trolley car can be relegated to the limbo of discarded things, along with the stage coach, the horse car, and the cable car; that the motor bus is the vehicle best adapted to the requirements of surface transportation in cities; that the motor bus is superior in speed, adaptability, safety and comfort, and it figures less than the trolley car, only in cost; that the solution of the transit situation in this city will ultimately resolve itself into the subways and elevated lines carrying long haul north and south bound traffic, and the buses, with the street cars eliminated, carrying people cross town and limited distances north and south.

It is my belief that before the end of 1920, hundreds of municipally owned and operated buses will be in service in the City of New York. As I have stated before, why continue an inadequate transportation system which has defaulted in its franchise obligations, when a highly profitable bus system, can be substituted almost immediately?

Trailers Are Fast Becoming a Big Factor in Hauling

The great oil companies in the producing fields of Texas, realizing the value of trailer hauling, are using large num-bers of two-wheeled pole trailers for hauling casing to their wells. Large distributing businesses, such as wholesale grocers and the great metropolitan milk companies, are standardizing their hauling with short wheelbase trucks and semitrailers. Some of the large industrial plants are using Trailmobiles for interdepartmental hauling. In the lumber business, both in hauling from the woods to the mill and from the lumber yard to the building job, the number of Trailmobiles in use is constantly increasing.

As is usual in such cases the progress of the trailer hauling principle is fastest where the operators know most about their costs. There is not only a large saving in first cost, but also a large saving in the operating expense. Where a considerable number of units are operated these economies amount to an imposing total at the end of the year.

Car Service Commission Shows Keen Interest in Shipping Conditions

As a result of the conference of the N. A. C. C. with the Railroad Car Service Commission, a circular has been issued to all railroads urging such a handling of automobile cars as to meet present conditions. The commission's circular advises the railroads that maximum requirements for automobile loading are at hand. Shortage of automobile cars has resulted in large accumulation in producing territories. The railroad cars are badly scattered and must be in possession of their owners. Local loading of automobile cars with miscellaneous freight should be avoided as far as practicable, but when necessary should be loaded in direct route to the railroad car owners or to automobile producing territory, but not beyond. Otherwise, and in the absence of automobile loading to owning lines, cars should be sent empty to the car owner under car service rules.

The effect of this circular on the movement and handling of automobile cars is to be carefully noted by the commission, and if results are not satisfactory further steps will be taken to gain control of the cars.

The conference was attended by twelve representatives and members of the N. A. C. C.

There are now over 15,000 automobiles and trucks in the Michigan-Toledo zone stored by factories, awaiting shipment. This represents about \$21,000,000, with interest costs of about \$100,000 per month. Even this may be doubled, as thousands of machines have been driven away short distances, and stored for shipment. With the advent of spring weather driveways will be stopped by

Without automobile road conditions. cars and with driveways stopped production will have to be curtailed or stopped, involving thousands of skilled mechanics, the financing of the industry amounting to \$6,000,000 per day in finished product the involvement of allied industries in a similar way, and the stopping of the business of automobile and truck dealers throughout the country.

Some 52,000 automobile cars are urgently needed where they are ownedthe Ohio-Indiana-Michigan roads; and 32,000 owned by western, southern and eastern lines, and all of these cars should be sent into the Ohio-Indiana-Michigan territory, loaded by the factories, and routed home, thus bringing about a relocation of cars and at the same time rendering immediate relief to the industry.

Secretaries of dealers' associations throughout the country are urged to daily visit freight yards to ascertain condition and disposition of automobile cars and report all misuse to the National Dealers' Association, Chicago.

Vehicle Bridge Certain Over Niagara River

A vehicle roadway, the first to cross Niagara river, will be part of a new bridge that it is now announced is certain to be built, co-operatively, by the New York Central, Michigan Central, Toronto, Hamilton and Buffalo, and the Canadian Pacific. The bridge will cross the river at Grand Island, the American terminus being in the River Road. The railroads have secured a three mile right of way across Grand Island. Vehicles using this bridge will save a 60-mile detour, or a ferry passage, now necessary for Buffalobound tourists from Canadian points.



House Moving by Truck

The owner of this house, a frame bungalow of five rooms, was recently confronted with the problem of moving it a distance of four miles or tearing it down. Mr. H. E. Cooper, of San Diego, volunteered to undertake the task, although the owner of the house was very doubtful as to the practicability of moving a house by truck, he finally took what he considered his only chance. The house was jacked up on wheels, and a Federal truck towed it the entire distance without a hitch in about six hours.

The Resiliency is Built in the Wheel

A Resilient Rolling Equipment

Which

Hundreds of Motor Truck Distributors

Have and Are

Recommending to Their Trade

Many of the leading motor truck distributors have experienced a farreaching effect with their trade by recommending Sewell Cushion Wheels.

Here Are the Reasons

It is a well-known fact to truck distributors that a Sewell-equipped truck has a *longer life* with more continuous service, and rarely frequents their service stations.

The savings which Sewell Cushion Wheels register each working day greatly increase the good-will of the trade toward their trucks with the result that the re-ordering of the same make truck equipped with Sewell Cushion Wheels is a common occurrence.

Therefore, the distributor feels himself well repaid for recommending:

The Time-Tested, Road-Tested, Efficient and Economical

Sewell Cushion Wheels

Sewell Cushion Wheel Co., Detroit



Metal and Rubber Markets

Aggregate orders for structural steel placed during the latter part of March indicated the substantial character of the demand that is waiting to be satisfied. In a majority of the orders accepted the needs are for industrial expansion although there was much more construction work awarded.

The problem in various phases that was likely to arise when the governmental control of prices disappeared has been somewhat mitigated by reported prospects of a more generous coal delivery after April 1. A freer market for coal and the probable increase of railroad efficiency by fully 50 per cent. by summer should considerably improve steel conditions.

Steel Products Prices

Per ton-Pittsburgh-				
Bessemer billets\$60	00	a	\$70	00
Open hearth 60	00	a	70	00
Forging billets 80	00	a		
Sheet bars 70	00	a	75	00

Sheet

The following	prices	are	for	100	bundle	lots
and over f.o.b.	mill:					
WWW 4 1	9 (49					

Blue Annealed Sheets-					
Pittsburgh (base)	\$4	50	a	\$6	50
Philadelphia	4.	725	a	5	.725
Chicago	5	27	a	7	27
Galvanized Sheets of Black	Sh	eet	G	aug	e-
Pittsburgh	6	00	a	8	00
Chicago	6	27	a	8	27
Tin-Mill Black Plate-					
Dittehurch			-	5	95

Structural Material

Structural shapes, Pittsburgh \$3 00 a \$4 00 Structural shapes, Phila 3 00 a 4 25

Tank plates, Pittsburgh	3	75	a		
Tank plates, New York	4	02	a		
Steel bars, New York	3	75	a	4	25
Steel bars, Pittsburgh	4	50	a	*	
Rails-Standard Bessemer					
sections, mill 45	00	a		60	00
Standard, open hearth, mill	47	00	a	62	00
Light sections-25 & 45 lb	3	00	a	3	50

Iron and Steel at Pittsburgh

		-		
Bessemer iron\$43	40	a		
Bessemer steel, f.o.b. Pitts 60	00	a		
Skelp, grooved, steel 2	75	a	3	60
Skelp, sheared, steel 3	00	a	3	60
Ferromanganese (80%)225	00	as	250	00
Steel, melting scrap 28	00	a	29	00
Steel bars 3	75	a	4	75
Wire rods 70	00	a	75	00
Iron bars 4	25	a	4	50
Plain wire 3	50	a	4	50
Plain wire, galvanized 3	50	a	4	00
Cut nails, nominal 6	191	6a		
Wire nails, Pittsburgh 4	00	a	4	75
Steel hoops 4	00	a	4	50
Chain rods 65	00	a	70	00

OTHER METAL PRODUCTS.—Following are the prices current for brass and bronze products.

and bronze products.			
Copper sheets, not rolled\$29	50	a	
Copper bottoms 38	00	a	
Seamless tubing, bronze 34	50	a	
Seamless tubing, copper 32	00	a	
Copper rods 26	75	a	27 50
Copper wire 22	25	a	
Cut lead sheets 12	50	a	
High brass wire 25	25	a	

High brass sheets	25 25	a	
High brass rods	23 75	a	
Low brass sheets	27 25	a	
Low brass wire	27 25	a	****
Low brass rods	28 00	a	
Brazed tubing, brass	37 00	a	
Brazed tubing, bronze	41 75	a	
Brazed tubing, copper	41 75	a	
Seamless high brass tubing	30 50	a	
Seamless low brass tubing	33 00	a	
Sheet zinc	12 50	a	

ALUMINUM.—The position of aluminum continues steady at current prices. Virgin metal in ingots, 98 to 99 per cent., is quoted at \$31 a 32, remelt at \$30.50 a 31.50 and No. 12 remelt at \$29 a 30.

ANTIMONY.—The market is reported quiet and easier, concessions being made on lots afloat at 103/4c a pound. Retail price is 11c.

GRAPHITE.—The demand is light with little active business. Crude Mexican ore is quoted at \$32 60 per ton New York by the largest interests. Selected Amorphous runs between \$50 and \$60 a ton. Korean 33/4c a pound, Madagascar 9c a pound, and Ceylon 47/8c to 16c a pound.

TUNGSTEN.—The Senate Finance Committee reported the Tungsten bill favorably. Very little ore has changed hands, and what business there is seems to go abroad. The market price seems to be \$6.50, with \$8.50 to \$10 for Bolivian ore.

OLD METALS.—Aluminum scrap continues unchanged. Copper remains quiet, with most dealers and large consumers out of the market. Lead continues firm. Block tin scrap and pewter dishes are scarce and active. Buying and selling quotations follow:

Buying, Selling

Aluminum-

Cast scrap	2074 8140
Sheet scrap	241/2a25
Clippings25¼a26½ Copper—	28½a29
Heavy machinery comp14 a141/2	a161/a17
Heavy and wire14 a141/4	151/2a15%
Light and bottoms121/2a13	141/a141/2
Heavy, cut and crucible.15 a151/4	161/a17
Brass, heavy 8 a 81/2	91/4 a 93/4
Brass, casting 9 a10	11 a11½
Brass, light 7½a 8	8%a 9
No. 1 clean brass turn'gs 71/4 a 71/2	81/2a 9
No. 7 comp. turnings101/2a11	12 a121/2
Tea lead 51/4 a 5.40	5% a 6
Lead, heavy 7 a 71/4	734a 8
Zinc scrap 41/4 a 41/2	51/a 53/4
Solder joints	12 a121/2
New zinc clippings 5 a 51/2	6 a 61/4
Pewter dishes40 a41	43 a44
Block tin, scrap50 a52	55 a56

Rubber Prices Nominal

The market for plantation rubber is still under the influence of the uncertainty produced by recent fluctuations in sterling exchange. Holders hesitated to put out firm quotations, especially on stock in forward positions, and buyers were equally reluctant to make bids. The market although unsettled, is still nominal.

Para—Up-river, fine	411/2a	42
Up-river, coarse	31½a	
Island, fine	41 a	

Island, coarse	201/4	3	
Caucho, ball, upper	321/4		
Caucho, ball, lower	281/		
Cameta	21	n.	**
Plantation-First latex crepe	48		**
Brown crepe, thin, clean	45	a	
Rolled, brown, crepe	40	a	41
Smoked ribbed sheets	471	2a	
Centrals-Corinto	32		
Esmeralda	32		
Guayule, wet	25	a	27
Balata, block, Ciudad	76	a	78
Balata, block, Colombian	48	a	52
Balata, block, Panama	46	a	
Balata, sheet*1	00	a	
Mexican—Scrap	30	a	

* Nominal.

SCRAP RUBBER. — The market would be lifeless but for limited buying of boots and shoes by reclaimers and of auto tires by rebuilders. Prices are

110111111111																
Boots and sh	oes .			 							,			7	%a	736
Arctics, trim	med			 	0				0	۰				6	a	
Arctics, untr	imm	ed		 							0			5	a	
Tires-Auton	obile				0 1			0	0		0			3	1/4a	**
Bicycles, pne	uma	tie		 						a			0	2	½a	[
Hose, steam,																
Inner tubes,	No.	1.	ø	 		0	٠					0			3.	141/2
Inner tubes,	No.	2.		 				0		0			0		a	9

Trailers Materially Lowers Hauling Cost of Lumber Company

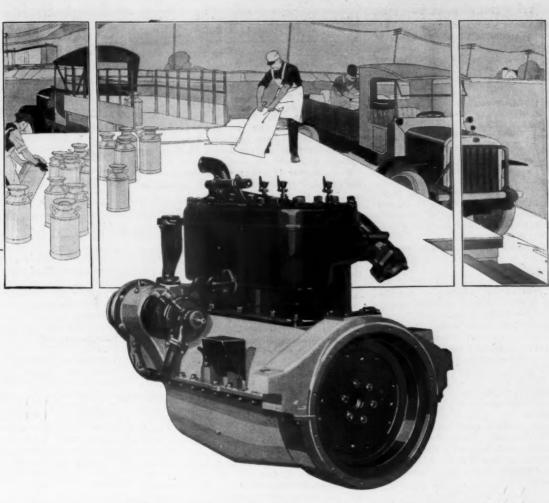
From the time the tree is felled until placed in the building, it has been found that lumber must be hauled at least five times. Thus, it may be readily seen how the hauling expense can amount to 25 per cent or more of the selling price of lumber.

The Hine Lumber Co., Detroit, Mich., kept strict check of the single haulage item of delivery of lumber from the yard to the customers. They found that this one movement of the lumber by horse-drawn trucks cost 6 per cent of the selling price of their lumber stock. Later they adopted trucks and a carefully kept cost account shows the cost to be 4 per cent of the selling price.

A few years ago they experimented with trucks and trailers, and a few months' experience showed a greater movement of lumber by the use of trailers than had been possible with motor trucks alone, yet the operating cost of their delivery department was not increased. This lead to the creation of a system involving the use of trucks and trailers in a big way.

This company now uses three Fruehauf 4-ton and three 6-ton semi-trailers. For all six trailers they have but two $3\frac{1}{2}$ -ton tractor trucks. Each tractor handles three trailers, while one trailer is being loaded the second is on the way with the tractor and the third is being unloaded at the job. Three trailers to each tractor permitted continued loading, moving and unloading. The tractor is not forced to lose any time waiting for a load.

Thus, each tractor is not only handling three times as much lumber as it would carry without the trailer, but it is able to make two or three times as many trips. Consequently the biggest single expense item in the production and selling of lumber is reduced.

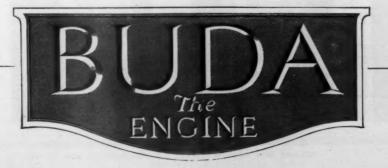


No single factor stands out as responsible for the economy, power and long life of the Buda engine. These are the results of a uniform excellence in design, materials and workmanship.

Consequently, in every field of truck service, in the hands of expert or of comparatively inexperienced drivers, the Buda engine is delivering an exceptionally satisfactory engine performance.

You can follow confidently the judgment of 85 representative makers of automotive products who have standardized on the Buda engine—the quality result of 39 years of engineering and manufacturing experience.

THE BUDA COMPANY, Harvey (CHICAGO), Ill. ESTABLISHED 1881



F. H. Akers, sales manager for the Reo Car Co., is to have general charge of advertising, as sales and advertising manager, the department having been merged, and now under general direction of Walter K. Towers, sales promotion manager, F. L. Waite, who held the position for seven years, having resigned, and is now connected with the New Way Motor Co., Lansing, Mich.

Godfrey H. Atkin has been appointed by the Electric Storage Battery Co., Marquette Bldg., Chicago, as western district manager, with offices in Chicago, for the sales offices, warehouses, service stations, and all departments of the company in Chicago, St. Louis, Kansas City, Minneapolis and Denver.

Raiph S. Allen, former general sales manager of the Duratex Co., Newark, N. J., has been made vice-president and a director. New buildings have just been started to supply 100,000 sq. ft. floor space.

Charles E. Bailey has been made general sales manager of the Paragon Motor Car Co., Connellsville, Pa.

L. M. Barr, sales manager of the Fyrac Mfg. Co., Rockford, Ill., announces that the spark plugs of the company, hitherto mostly distributed to the western trade, will be sent into the eastern half of the United States by means of a sales and advertising campaign.

E. A. Bates has accepted position as president and general manager of the Booty Carburetor & Mfg. Co., Chicago. He was with Benecke & Kropf.

E. W. BeSaw, who has been western sales manager for three years of the Firestone Tire & Rubber Co., with headquarters in Akron, is now general sales manager, succeeding A. B. Partridge. F. K. Starbird, district chief, with headquarters in Minneapolis, becomes western sales manager. J. E. Mayl, district chief, Boston, Mass., becomes eastern sales manager.



E. H. Kidder New England sales manager



Thomas R. Burton Central sales manager

Personal Items

Orton C. Beacraft has been made production manager of the Keystone Motor Truck Corporation, with factories at Oaks, Pa., and offices at Chestnut & 42nd Streets, Philadelphia. He comes from Bethlehem Motors Corp., where he was superintendent and factory manager of the Pottstown plant.

Lloyd J. Bohan, with the Gurney Ball Bearing Co. the past three years, is now sales representative of the Torbensen Axle Co., for Chicago and territory west of that city.

E. L. Carter is now general manager for McCord & Co., West Pullman, Ill., producing gray iron cylinder castings.

Frank R. Carroll, one time Los Angeles branch manager, later district manager, San Francisco, for the B. F. Goodrich Co., and who went to the Orient for the Goodrich interests a year ago, has been made vice-chairman of the board of directors of the Yokohama Rubber Co., Ltd.

H. C. Carter has been made factory manager of the Napoleon Motors Co., Traverse City, Mich. He was with the Dort Co. for some years, and later organized the inspection department of the Republic company.

F. A. Cornell, the first service manager of the Willys-Overland Co., has been made vice-president of the Overland-Harper Co., Forty-second and Chestnut Sts., Philadelphia. He comes directly from the Timken Roller Bearing Co., where he was manager of their machinery and industrial appliances, and had previously represented Timken as eastern representative, for all the motor car and truck factories from Toledo to the Atlantic coast.

Joseph M. Cudahy, former president of the Cudahy Packing Co., and for the last few years vice-president of the Sinclair Refining Co., has been elected president of Sinclair, and succeeds W. H. Isom, who is now chairman of the board. Mr. Cudahy has just returned from France where he formed a company for the distribution of fuel oil, which will be carried there by the company's tankers.

B. W. deGuichard, who has been with the Champion Ignition Co. since its organization, has been made vice-president and director.

W. S. Dellett, northwestern manager for the Rubber Products Co., Barberton, Ohio, is now sales manager, Barberton, succeeding Edw. S. Babcox, resigned. H. P. Harding has been appointed eastern manager, and J. W. Blaser, Akron, has been elected treasurer and director of sales.

Recent Appointments Made by the U. S. Tire Company



P. C. Anderson Western sales manager



Harry H. Hubbard Southwestern sales manager

John H. Dwight is now assistant general sales manager of the Saginaw Products Corp., Saginaw, Mich.

C. F. Eason, chairman tractor division of Hyatt Roller Bearing Co., has resigned, although he will still be retained in an advisory capacity, and is now in charge of the newly organized Moline Engineering Development Co., at Moline, Ill.

A. L. Ellis has taken charge as production manager of the Jenkins Vulcan Spring Co., Richmond, Ind., coming from the spring division of the Detroit Steel Products Co.

W. B. Fairfield and C. K. Lenz have charge of the Cleveland office, 310 Engineers Bldg., of the Chase Metal Works and the Chase Rolling Mill Co., Waterbury, Conn. Brass, bronze, copper and nickel-silver products sales for Ohio, Indiana and Michigan are handled from this office.

R. B. Fisher has been made general sales manager of the Buda Co., Harvey, Ill., and will direct the advertising, and both the domestic and foreign sales.

Henry C. Futch has been made general manager of the White Hickory Motor Truck Corp., a promotion from general sales and advertising manager, and will now devote almost all his time to production matters.

Harry Garner, for seven years with the White Co., is now with the Service Motor Truck Co., as Chicago branch manager.

Waiter W. Gaskill, 141 Milk St., Boston, Mass., has been made New England agent of the Roller-Smith Co., New York.

W. G. Guthrie has been appointed internal adviser of all Willys and Willys-Overland interests. For the past two years he has been efficiency engineer for the Olds Motor Works. On July 15 he goes to Europe, and will spend two months at the new Willys-Overland and Crossley plants in Manchester, England.



William C. Price Southern sales manager



E. S. Roe Eastern sales manager

S K F Industries Wants Worries

—that is, the BEARING worries of the American automotive manufacturers who are searching for means of maintaining quality in the face of rising costs and raw material shortages.

To give the public what it wants ... quality cars in quantity delivery ... is calling in many instances for re-adjustments of design, changes in material specifications and manufacturing methods

And such problems of production, so far as they concern BEARINGS, S K F can take from your Chief Engineer's shoulders with the assurance of immediate help.

For not only has the S K F institution developed the antifriction bearing to its highest perfection, had it accepted by many of the leading producers of quality cars in America, but also, S K F has established a scientific research and engineering organization that can place in your designers' hands the sum total of the industry's knowledge of bearing application and design.

Manufacturers are invited to avail themselves of this freely offered cooperation.

S K F INDUSTRIES, INCORPORATED

Sales, Service and Research Division 165 Broadway, New York

590



Hugo C. Gibson, a well known engineer, formerly with The Vacuum Oil Co., has recently accepted the position of chief engineer of the Root & Van Dervoort Engineering Co., East Moline.

H. A. Grubb will be vice-president and acting general manager with offices in Cleveland, of the Oldfield Tire Co., thus enabling President Barney Oldfield to devote more time to supervision of production and field sales activities.

L. R. Jackson, formerly Indianapolis branch manager of the Firestone Tire & Rubber Co., is now manager of the Pacific coast district, with offices in San Francisco.

Lee J. Kearns is now sales manager of the D. C. Warren Motor Car Co., Portland, Ore. He has been with the Seattle branch of the Willys-Overland since 1912, the past two years being sales manager.

A. L. Kimball, former chief engineer of Fulton Motor Truck Co., is now sales engineer for the Pierce Governor Co., Anderson, Ind., having charge of all territory east of that state. He is a University of Michigan graduate, and member of the S. A. E.

William P. Kiser, many years a Chalmers Co. executive, is now in the financial department of General Motors. At one time he was secretary of the Dayton Cash Register Co., and one time treasurer of the Toledo Scale Co.

E. B. Knowles, for fifteen years connected with the brake lining business, has become secretary and general manager of the Staybestos Mfg. Co.

B. R. Leisure, Baltimore branch manager of the Firestone Tire & Rubber Co., is now Philadelphia, Pa., district manager.

C. L. Mason, former western service manager of the Firestone Tire & Rubber Co., is now in Akron, as manager of the north central district.

Henry G. McComb, a pioneer engineer in the automotive field, has been made general manager of the Russel Motor Axle Co., by the McCord Mfg. Co., Inc., owner and operator of the company.

J. H. McDonough, former district representative, central district, of the Firestone Tire & Rubber Co., has been made manager of the southwestern district, headquarters at Dallas, Texas.

I. B. Meers has taken up his work as western sales manager for the Lewis-Hall Motor Corp., and has supervision over all sales of Hall trucks west of the Rockies. Before the war he spent four years on the Pacific coast as sales manager of the King Motor Car Co,

Robert Mehler, with the White Auto Co., Los Angeles, will become distributor in partnership with Robert Stanton.

S. K. Miller has been elected vice-president of the Kentucky Wagon Mfg. Co. He became assistant sales manager in 1914, and general sales manager in 1918.

J. P. Patterson, former Cincinnati branch manager of the Firestone Tire & Rubber Co., is now manager of the south central district, headquarters in Cincinnati.

John Perkins now has charge of production at the new Lewis-Hall motor factory. Mr. Perkins was trained in the Brown and Sharpe Works, and besides other wide manufacturing experience with nationally known concerns was superintendent of the truck division of the Packard Co. and had charge of all the war activities.

Edgar F. Power, for 30 years salesman for Chase and Sanborn, has associated himself with the Packard Auto Exchange Co., Fenway Park, Boston. Howard S. Power, a brother, is general manager of the firm.

W. J. Rabbitt, equipment manager of the Todd Rubber Co., with stores in Massachusetts and Connecticut, has resigned. He is now president of Keith and Wilson, New Haven, Conn.

Brom Ridley, former advertising manager of the Houston Chronicle, and other Southern dailies, is now advertising manager for the Southern Motor Mfg. Asso., Ltd., Houston, Texas.

A. G. Ripberger is now chief engineer of the steel and tube departments of the Timken Roller Bearing Co., at Canton, O. He was on the engineering staff of the Illinois Steel Co., Gary.

E. B. Ross, vice-president of the Clark Equipment Co., makers of Clark truck axles and wheels, has been elected for his second term as mayor of Buchanan, Mich.

Paul E. Ryan is now manager of the Perfection Spring Co. division of the Standard Parts Co., vice J. B. Childe, resigned.

J. Sarovitch, of Warsaw, Poland, studying construction in the General Motors truck factory, will return to Poland as a representative of the company.

J. E. Shaw, for several years sales manager of the Savage Tire Co., San Diego, Calif., has the Savage Tire Sales Co., Des Moines.

E. E. Seig has been promoted from the head of the credit department of the Republic Motor Truck Co., to be assistant general sales manager. He has been with the Republic since its organization.

Major A. G. Stevens, highway transportation expert of the Council of National Defense, has been made head of the highway transport division of the Goodrich Travel and Transport Bureau, Akron, of which Raymond Beck is chief.

H. D. Taylor is now vice-president in charge of operation of the recently augmented McCord Mfg. Co., Inc., his supervision including the McCord and Russel Axle plants, Detroit, and the West Pullman, Ill., foundry.

R. B. Tracy, who had more than twenty years' experience in the tire industry, fifteen of which were spent with the Michelin Tire Co., is now western manager of the Globe Rubber Tire Co.

Charles A. Tucker has been made sales manager of the Olds Motor Works, succeeding P. L. Emerson, resigned.

John O. Vickery, who has been a salesman with the Pyrene Mfg. Co., is now covering the entire South as a member of the sales staff of the White Hickory Motor Truck Corp.

Corliss Wadleigh has been made Boston, Mass., branch manager of the Fisk Rubber Co., Chicopee Falls, Mass. He has been with the Knox Motor Co., and also the Republic Tire Co.

Wilbur W. Wood is now with the Traffic Motor Truck Corp., in charge of local and national advertising.

Retail Trade Items

Fred A. Bennet, Los Angeles, will represent the Napoleon Motors Co. on the Pacific Coast.

Taliaferro Milton has succeeded Godfrey H. Atkin as manager of the Chicago office of the Electric Storage Battery Co.

Charles E. Miller, one of New York's first equipment jobbers, is going to move to 231 West Fifty-fourth St., and be right in the heart of Motor Row. He has bought the five-story building there, and is making \$25,000 alterations, including large show room and display window. He has been jobbing on a large scale for 24 years.

William Mall is president of the gheny Motor Car Co., now located at 511-19 Water St., Pittsburgh. The company is erecting a two-story fireproof thoroughly modern garage building at 104 to 108 North Ave., Northside, Pittsburgh. The first floor includes a fine show room, and the usual space equipment, including offices. The second floor is reached by a concrete ramp for cars and trucks, and will contain the machine shop, repair shop, stockrooms, car and truck storage, welding and battery repair departments. August 1 is set for service in the new garage, and Signal worm drive trucks and a first class touring car will be the special features of the firm's business. William C. Reinhard is sales manager, and Albert R. Tessmer, service manager.



James McGlashan
Who was recently appointed chief engineer of the Martin-Parry Corporation, York, Pa., and Indianapolis, Ind.



Ray T. Middleton
Vice-president and Director of
Sales and Advertising Kelly
Metals Company, Chicago, Detroit and Los Angeles.



D. J. Thorne
District sales manager for the
Diamond T Motor Car Co., in
Michigan, Ohio, Kentucky and
Indiana.



C. W. Butterfield
Recently appointed sales manager of the Herschell-Spillman
Motor Co., North Tonawanda,
N. Y.

GARFORD



EQUALLY important to the dealer and the truck-buyer are the returns from the recent widespread investigation among Garford users. 97.6% went on record as 100% satisfied.

This is sound proof of Garford Low Cost Ton-Mile. Write for the figures.

Safred

Lima, Ohio

That the United States Army has made Garford a Class A Standard is another proof of Garford serviceability

TRUCKS

The Seiden Truck Corp., Rochester, N. Y., has declared a regular quarterly 2 per cent dividend on the first preferred, and regular quarterly 2½ per cent on the second preferred stock to holders of record as of March 16. 1920.

The Milwaukee Rolling Mill Co. is a new corporation in Wisconsin with new capital stock of \$3,000,000, and will build a sheet mill capable of producing 45,000 to 60,000 tons a year, to serve body builders. W. W. Irwin, until now president of the Canton, Ohio, Sheet Steel Co., will be president and general manager.

The Fisher Body Ohio Co. has bought 40 acres in Cleveland for \$500,000 and will build a factory with a million and a half feet of floor space, making it one of the largest car body factories in the world.

Ajax Rubber Co. has authorized a stock increase from \$10,000,000, its present capitalization, to \$20,000,000.

Dodge Brothers has established a permanent office in London, England, to take charge of their English and Continental European business. The location is Oxford Circus House. 245 Oxford St.

The Davis and Thompson Co., Milwaukee, has been incorporated for \$100,000 and a new plant will be erected at once. Besides other metal working machinery a continuous milling machine will be produced.

The Gaston, Williams & Wigmore Export House, Rochester, N. Y., directed by R. H. Salmons, vice-president of the Selden Truck Corp., has sent J. H. Wise to South America to investigate in the Latin-American states and develop possibilities for Selden truck sales. Mr. Wise has exceptional qualifications for this work, having nearly eighteen years of experience in selling cars in Mexico, Cuba, Spain and in Central and South Amer-Sailing directly to Rio Janeiro, and continuing as far south as Buenos Aires, his trip northward will include Fara, Bahia. and a study of Trinidad, Colombia and Venezuela. Over six months will probably be required for this survey.

The Dieffenbach-Westendorf Mfg. Co., Baltimore, recently organized entirely from the personnel of the Black & Decker Co., Towson Heights, Baltimore, has purchased the latter's plant complete. The new president, O. W. Dieffenbach, was manager of the purchased plant, and William Westendorf, vice-president and general manager, was superintendent. George M. Kimberly, treasurer for some years, continues in that capacity for the new company.

The Minerva Engine Co., Cleveland, has increased its capital stock from \$250,000 to \$1,000,000 to provide greater factory facilities. The first unit of a gray iron foundry, to contain 10,000 sq. ft., has been started on the company's eight-acre location at Maple Heights, which will give a daily output of 16 tons.

The Covert Gear Co., Lockport, N. Y., is building a \$270,000 three-story factory, which will increase gear production 40 per cent.

The Parker Tire and Rubber Co. has expanded its capital from \$750,000 to \$3,000,000. Improvements and addition this year include additions to factory buildings, and an expenditure of about \$500,000 on the new main factory structure.

The Essenkay Products Co., makers of tire fillers, have bought 600,000 sq. ft. vacant land at Wentworth and W. 83d Street, Chicago, and the coming summer will erect a \$200,000 plant containing 120,000 sq. ft.

The Ursus Motor Co., 6601 Grand Ave., Chicago, plans to make a truck that will combine a tractor feature. The truck is converted into a tractor through demountable tractor treads and a secondary reduction in the rear axle.

Factory News

The Witherbee Storage Battery Co., Inc., New York, has greatly increased production by erecting another factory in New York, and still another plant in North Bergen, N. J.

Fuller & Sons Mfg. Co., Kalamazoo, Mich., in order to meet demands for their transmissions, have been forced to establish their own foundry for the production of gray iron castings for their own use. The foundry is now in full operation.

The Master Tire and Rubber Co. has increased its capital from \$300,000 to \$1,000,000 for the erection of a large addition for increased production of tires and tubes.

The Schurmeirer-Whitney Co., Minneapolis, will build a four-story \$100,000 building for making truck bodies. This concern began as wagon builders in 1852.

The Garford Truck Export Department, Lima, Ohio, moved to 41 Park Row, New York, April 1. Earl F. Sayers continues as director of exports.

The Lapeer Semi-Trailer Co., Lapeer, Mich., has been sold, the \$100,000 capital stock of the company being bought at approximately par value. The purchasers plan to immediately expend \$200,000 for expansion and another \$200,000 will later be spent for enlarged factory and equipment. The new owner has not been disclosed.

The Pennsylvania Rubber Co., Jeannette, Pa., has declared a quarterly dividend of 1% per cent on preferred, and 1½ per cent on common stock, payable March 31 to stockholders of record of March 15, 1920.

The Marion Machine and Foundry Co., Marion, Ind., by the erection of four large units has doubled its facilities and very soon two additional buildings will go up, which will be occupied by foundry and administrative offices.

The American Acro Company, Chicago, producer of the Juelson two-bladed automobile fan, has been reorganized. F. H. Wellington, South Bend, is president and treasurer; Col. George M. Studebaker, vice-president, and Paul V. Harper, Chicago, treasurer. The administrative offices are now at South Bend, Ind.

The General Motors Corporation will soon erect a \$250,000 building in Dallas, Tex., for use of the United Motors Service, Inc., Detroit, a General Motors subsidiary.

Clark Equipment Co., Battle Creek, Mich., has taken 23 acres and will erect additional factory space for a personnel of 500 men. The same features of plant design and decoration which have made the Clark plant at Buchanan, Mich., a park-like beauty place "comparable to a college campus in the springtime," will be employed.

Hamilton Motors, Grand Haven, Mich., will increase its capital from five hundred to seven hundred and fifty millions, caused by increased demand for Apex trucks.

Anderson Electric Specialty Co., Chicago, has changed its style to Anderson Electric and Equipment Co. General office and factory remain at 118 S. Clinton St., Chicago.

The Eisemann Magneto Corp. has received a contract from the Maccar Truck Co., Scranton, Pa., covering a period of 13 months. The corporation also has a new sub-station in Washington, D. C., known as the Auto Electric Service Co., which is a sub-station of the Auto Engineering Co., Baltimore, which is the Eisemann official service representative. Contracts for magnetos have also been signed recently with the Superior Motor Truck Co., Atlanta, Ga., and the Commerce Motor Truck Co., Detroit.

The Precision and Thread Grinder Mfg. Co., maker of the multi-graduated precision grinder, has been purchased by J. H. Malone, F. Rodger Imhoff will continue as field engineer, with headquarters in Detroit.

The Standard Parts Co. have provided for their needed increased business facilities by securing a \$6,000,000 loan, behind which are five of Cleveland's foremost banks, the Case National, of New York, together with Otis & Co., and Borton & Borton, Cleveland.

The Hooven Radiator Company now occupies a large new factory at 510 North Western Ave., Chicago, and are turning out 1000 radiators per day with capacity for double that number. They announce having perfected a new tubular radiator especially designed for heavy duty trucks and tractors.

The Commercial Auto Body Co., 16th and Pine Sts., St. Louis, has taken over the fully equipped plant of the Chevrolet Motor Co., St. Louis, and will build its line of bodies there, enabling more than 550 bodies per day to be made.

The Vesta Battery Corporation is the name under which the corporation known as the Vesta Accumulator Co. will hereafter do business, the management remaining the same. Capitalization has been greatly increased, and offices remain in Chicago.

The Harrisburg Pipe and Pipe Bending Co., Harrisburg, Pa., announce the election of A. K. Barker, president, in charge of sales; N. W. Cassel, secretary, in charge of purchases; E. C. Smith, vice-president and general superintendent of plant, and E. C. Frey as treasurer.

The American Malleables Co. has transferred its general sales office to 1409 Kresge Building, Detroit, and P. G. Smith, vice-president and sales manager, is in charge.

The Indiana Metal Products Co., Indianapolis, is now the manufacturer of the F. and W. Universal Wheel and Gear Puller, that has hitherto been made by the F. & W. Mfg. Co. of that city.

The Oxweld Acetylene Co., Newark, N. J., and Chicago, announces the "Everready" welding and cutting outfit. The apparatus has been in use in metal working trades for several years as the "Prest-O-Lite" apparatus. It is designed for exclusive use with compressed acetylene in cylinders, and is moderately priced.

The Briscoe Motor Co., Jackson, Mich., has acquired the plant of the John Bohnet Co., Lansing, and will make improvements and additions.

The Hayes Wheel Co., Albion, Mich., is adding new buildings and machinery and expects to put out 25,000 hubs per day. In 1919 4,229,098 wheels were produced.

The K-W ignition Co., Cleveland, has obtained a decision favorable to it, in its suit against the Ford Motor Co., before Federal Judge Albert B. Anderson, sitting at Indianapolis. The court held that the Ford company had infringed the patent covering the well-known K-W spark coil. The appeal bond of the Ford company was fixed at \$1.000.000.

The Hercules Motor Mfg. Co., Canton, Ohio, has increased its capital stock from \$800,000 to \$1,500,000, providing for greatly increased production. J. G. Obermier is president; Gordon M. Mathew, vice-president, and Charles Balough, secretary, treasurer and general manager. A separate company, the Motor Castings Co., has been formed to supply the Hercules engine castings.

The National Tube Co. will begin at once erecting in Gary, Ind., a gigantic \$40,000,000 plant, employing 10,000. The site is on 1000 acres, which it will cover, extending two miles along the lake. A large number of homes for employees will also be built.

MARTIN CUSHION WHEELS

FOR MOTOR TRUCKS

No Bolts
No Nuts
Pressed on
Throughout
Light
Strong
Resilient
Durable



Backed
by
Nine Years'
Experience
in Building
Good
Cushion
Wheels

Adopted for Standard Equipment on "OLD RELIABLE" MOTOR TRUCKS

1½ to 7 Ton

MARTIN CUSHION WHEEL CO.

311-13 N. SANGAMON STREET CHICAGO, ILLINOIS
BRANCHES AND SERVICE STATIONS IN ALL PRINCIPAL CITIES
PRICES ON REQUEST

The Reliance Wheel Co., Youngstown, Ohio, at a special meeting, voted to increase capital to 25,000 shares non par common stock, and \$500,000 of 8 per cent. cumulative preferred. Production increase on a large scale will be made possible by building a new plant on 30 acres recently acquired on the New York Central and Erie lines.

The Westinghouse Electric and Mfg. Co. will erect four new buildings at South Philadelphia to care for immediate needs incident to the removal of the Machine Works from East Pittsburgh.

The Willys-Overland stockholders met March 24 to vote on a proposed increase in the capital stock from \$75,000,000 to \$125,000,000. The additional stock of \$25,000,000 of junior preferred and \$25,000,000 of common is to be issued at the discretion of the directors.

The Motor Wheel Corp., Lansing, Mich., plans for the merger have been completed, and the new \$11,000,000 corporation has begun operations. The merger included the Prudden Wheel Co., the Auto Wheel Co., the Gier Pressed Steel Co., and the Weis and Lesh Mfg. Co., Memphis, Tenn. William Newbrough is chairman of the board; Harry Harper, president; B. S. Gier, vice-president and treasurer. The first year's business of the combine is expected to be \$12,000,000.

Herschell-Spillman Motor Co., North Tonawanda, have been obliged to increase factory building to take care of the increased demand for their new six cylinder engine. A four-story concrete building 70 x 160 has been completed and more than \$500,000 worth of modern machinery is rapidly being set up, making possible an annual output valued at more than \$10,000,000. Besides this contracts have been let for buildings costing \$175,000, exclusive of the machinery installation. Ground has already been broken for this addition. When this addition is completed the company will be able to manufacture 100,000 engines yearly, divided between the four and the six cylinder models. W. Burtsell is president and general manager, and has been connected with Brown and Sharpe, and with the Packard company.

The India Tire & Rubber Co., having declared a 40 per cent. dividend, announces that it will double its tire production this year. D. A. Grubb is secretary and general sales manager.

The Interstate Drop Forge Co., Milwaukee, has been incorporated for \$250,000 by Major Sherman M. McFedries.

The Waukesha (Wis.) Brass Foundry Co. will build a complete new shop group costing \$100,000.

General Motors Corporation will hold its annual meeting April 28. A billion dollars, gross, is the expected business of the company for 1920. Net earnings, before taxes, of \$145,000,000 are expected, as against \$96,000,000 for 1919, and \$45,541,726 in 1918.

The Willys Corporation for the year ending December 31, before the deduction of dividends and taxes, reports total profits of \$5,346,683. Deducting dividends and taxes leaves a surplus of \$3,250,799. Total assets of the corporation, after all deductions, including taxes, reservations, liabilities, etc., are \$51,185,618, or \$341 a share for the entire stock of the first preferred issue.

The Kelley Tire & Rubber Co., New Haven, is to build a \$650,000 factory on a five-acre site in West Haven. Floor space of 65,000 sq. ft. will be gained.

The Hood Rubber Co. is offering stockholders opportunity to subscribe to \$1,000,000 7 per cent. cumulative preferred stock at \$100 per share.

Factory News

(Continued)

The Great Lakes Forge Co. is the new name of the interests that have acquired the stock of the Cochran Mfg. & Forging Co., and capital has been increased from \$100,000 to \$300,000. A new plant is being built on a 5½-acre site, the first unit being a 20-hammer shop, 50 x 200. Small automobile forgings, in variety, will be produced. Sales are managed through West and Dennett Co., 14 East Jackson Boulevard, Chicago, and Moses and Dennett, 80 Washington Boulevard, Detroit.

The Grand Rapids, Mich., Tire & Rubber Corp., recently newly organized, will specialize on cord tires exclusively, and plans to produce 30 x 3½ cords in quantity. I. A. Brown is president and general manager.

The Transport Truck Co. now has \$5,000,000 capital, a new plant, and a schedule of 3000 trucks for 1920. The "daylight" factory is on a 21-acre site, and new units are to be built. The new stock is distributed among 2100 men and women, nearly all residents of Mount Pleasant and central Michigan. Three models are now being made, all internal gear drive, and a 7000-lb. service truck is expected to be in production in July. M. F. Holmes is president; H. E. Chatter, vice-president, and A. E. Gorham, secretary and treasurer.

The Goodyear Textile Mills Co. is now the name of the former Pacific Cotton Mills Co., an adjunct of the Goodyear California Company, which expects to turn out 150,000 yards of cotton fabric weekly when the new factory is completed.

The Red Arrow Motors Co., capitalized at \$1,000,000, has I. L. Stoney, Lansing, Mich., as president. Three cities are candidates for the factory site, where the Red Arrow four-wheel drive truck will be made, as designed by Stoney and Bowman.

The Whitman & Barnes Mfg. Co. has elected A. D. Armitage, president; W. H. Eager, A. B. Hall and W. J. Elliott, vice-presidents. Mr. Elliott, heretofore manager of the St. Catharine's, Ontario, factory, will now have entire charge of the Canadian division of the company's selling and manufacturing. He has been with the company 27 years.

The Krasberg Engine and Mfg. Corp., piston rings, universal joints, etc., has completed a new factory addition, seven stories and basement, 200 ft. long, containing 130,000 sq. ft.

D. J. Woodward and Associates, San Antonio, Texas, have purchased the one-time radio aviation school and 60 acres, at Austin, and are organizing a company to manufacture truck bodies in what promises to be one of the largest body factories in the south. The present buildings were erected by the government at a cost of \$187,000, are of brick, and have water, electric light and power, sewers, and a spur railroad track. The labor problem is expected to be met by employing the spare time of students at the University of Texas, who need advantages of board, lodging and laundry, in return for a certain part of their time each day. Transportation to and from the university will be provided by the company.

The Brown-Lipe-Chapin Co., Syracuse, N. Y., will have, at the request of the General Motors Corp., the assistance of the duPont Engineering Co., Wilmington, Del., in the erection of a factory addition five stories high. This will include a new powerhouse, loading dock, and the cost will be from \$800,000 to \$1.000,000. The output of the new factory will be taken by General Motors.

The Hayes Wheel Co., of Canada, will operate the plant of the Dominion Wheel Co. at Lindsay, Ontario, which has been shut-down for three years. The factory has been prepared with machinery for manufacturing wheels for passenger and commercial cars, and for special repair work upon such wheels.

The Long-Wear Rubber Co., Elyria, has changed its name to the Long-Wear Tire and Rubber Co., and capital is increased from \$500,000 to \$5,000,000 to absorb the business of the Quality Tire & Rubber Co., Anderson, Ind. General offices have been moved to Anderson, and a large addition will be built at once in Elyria for producing cord tires. Frank W. O'Brien remains general manager, under whose direction tire production, which was 50 tires per day in 1918, is now over 1000 daily.

The Jorgensen Mfg. Co., Waupaca, Wis., producers of the Jorgensen primer, has increased its capital from \$70,000 to \$350,000. A new foundry will be built, as the first unit of a large new plant. The United Motor Service now handles all sales to the jobber and dealer trade of the primer. Sales of all other Jorgensen products will be handled by the company. P. J. Jorgensen is president, and I. P. Lord, vice-president.

The International India Rubber Co., South Bend, Ind., has increased its capital stock from \$1,000,000 to \$2,500,000. Plant additions will be built more than doubling present capacity.

The Rainer Motor Corp., New York, has recapitalized, providing for the issuing of 7,500 shares 8 per cent. cumulative preferred stock, par \$100, and 30,000 shares common stock, no par value. The new preferred stock has been purchased by a New York syndicate headed by John Nickerson, Jr., investment banker. The company will now erect extensive additions to the Flushing, L. I., plant, and plans for three times the production of 1919 in the present year.

The Rochester Motors Corp. has been organized by a syndicate headed by Symington, Hoffman & Co., New York, to produce motor car engines on a large scale. A large addition to the factory will be completed soon. A New York executive office will be opened. Donald Symington is president; Charles F. Morley is vice-president, in charge of manufacturing; Nicholas G. Ross, former general sales manager of the Duesenberg Motor Corp., is vice-president in charge of sales and advertising.

Wichita Falls Motor Co., Wichita Falls, Texas, has increased its capital stock from \$800,000 to \$1,800,000, the stockholders taking it all.

The Puritan Machine Co. has purchased the A. B. C. Starter Co., Detroit, makers of starting and lighting equipment for Ford cars.

The Universal Gasket and Mfg. Co., Cicero. Ill., makers of high grade copper asbestos gaskets, are now in a new building 120 x 140, which they are using to capacity of 15,000 cylinder head gaskets and 400,000 small gaskets per day.

The Liberty Beiting Mills, Paterson, N. J., has changed its name to The Durwyllan Company. The change brings increased resources and equipment. Norman E. Heil retains the presidency.

The Topp-Stewart Tractor Co., Clintonville, Wis., has voted a new issue of \$250,000 8 per cent preferred stock, to be expended in raw material and production for increased output of its four-wheel-drive tractor. An output of not less than one tractor per day is set for 1920. Edwin T. Boland, at one time general superintendent of Kissel Motor Car Co., Hartford, Wis., is works manager.

When you talk to an Apex Prospect

tell him about the Apex Twin Frame Construction—show him how it means double strength and resistance to the stresses of hard service.

tell him that the Apex has the Buda Engine, Torbensen Internal Gear Rear Axle, Timken Bearings, Fuller Transmission and Clutches, Stromberg Carburetor, Lavine Steering Gear, Electric Lights, and other equally important equipment. He will know what you are talking about. He knows that these units are famous and regarded as the best known to the truck industry.

tell him that all three Apex models have this great construction and internationally standardized units, the only difference being size and rated load capacity.

tell him that the Apex Twin Frame supports the working parts, permitting the frame proper to carry the pay load. If he is interested in the big 2½-ton Apex,

tell him with confidence, that no other motor truck of its size and quality can be purchased for \$2450. You have an inspiration in telling of the Apex to your prospects, with so much to offer. Demonstrate the Apex to your prospect. Give him a sense of its power and the perfect functioning of its long tried and fully proved units.

tell him how the Apex has stood

up and made good in every line of hauling.

tell him of the big mod-

ern exclusive truck building plant and the organization of truck experts behind the Apex. In the Apex you have everything to beat down any possible sales resistance.

Hamilton Motors Company

Factory: Grand Haven, Michigan

Export Department: 25 Beaver Street, New York, U.S.A. Cable Address: Hammotor, New York

We have a good proposition to offer capable truck merchants in territory where we are not now represented. Write for particulars.





 $2\frac{1}{2}$ ton \$2450

1½ ton 1695

New Incorporations

The Clarotta Mfg. Co., Milwaukee, has organized under Wisconsin laws, for \$1,000,000, by Walter A. Kuebler, Otto G. Pfeifer, and Thomas Hanson, to manufacture engines, motor vehicles, automotive equipment, machinery, etc.

The Waterburg Body Co. has been organized in Thomaston, Conn. Karl Eckhardt is president.

The Paimer Tire Corp. has been formed under the laws of Delaware, with capital of \$500,000, to make tires. H. L. Rogers, T. A. Irwin, W. G. Singer, of Wilmington, are incorporators.

The Associated Tire Stores Corp. has been incorporated at Dover, Del., with \$30,000,000 capital to make tires, and similar products. T. Croteau, M. A. Bruce, and S. E. Dill, Wilmington, are the incorporators.

Dunlop, America, Ltd., a newly incorporated extension of the British Dunlop Co., is to erect a tire plant and cotton mills at Buffalo, N. Y., at a cost of more than \$25,000,000. All the rights of the American Dunlop Tire Co. have been acquired by Dunlop, America, Ltd., which will be operated by an American executive staff. On the board of directors will be American as well as representatives of the British interests.

The Dawson Tire & Supply Co. has been organized at Newark, N. J., for manufacturing tires, supplies, etc., with capital of \$75,000.

The Slick Knox Steel Co. has been reorganized in Pittsburgh, and Josiah Kirby has been elected president, succeeding L. L. Knox, resigned. A plant about 500 ft. long will be erected at Wheatland, near Sharon, Pa., employing 900 men, for making automobile frames and forgings. The company has \$3,000,000 preferred and \$30,000 common stock. The main office will be at Sharon.

The Universal Piston Ring Co., Rockford, Ill., has been incorporated for \$100,000 and will manufacture at 1026 Charles St. until a permanent plant is secured.

The Republic Truck Sales Corp., with capital of \$100,000 has been formed by Wilmington, Del., incorporators, to manufacture and sell motor trucks.

The Kennedy Corp., with Joseph P. Kennedy, Baltimore, at the head, will build at once a \$2,000,000 plant at Curtis Bay, a Baltimore suburb, which will be the first unit of a \$4,000,000 factory, the second unit to be built by the close of 1920, for the production of car parts.

The Sterno Corp., Baltimore, recently incorporated for \$500,000, will erect in the vicinity of Baltimore a large plant for producing alcohol burning devices for automobile service, as well as electric heating and cooking devices.

The Superior Body Co., Rahway, N. J., has been incorporated with \$500,000, all common stock \$5 par value, to take over an old copartnership of the same name. The company is building additions, to take care of \$8,000,000 orders now on hand.

Fulton Motors Corp., headed by Garvin Denby, who was president and general manager of the Denby Motor Truck Co., Detroit, before its reorganiation a year ago, has a capital of \$1,500,000. The factory and property of the Fulton Motor Truck Co., Farmingdale, L. I., has been bought at a receiver's auction at \$290,000, and the present Fulton truck will be continued to be produced; larger heavy duty models to be also made shortly. Production, which stopped during the receivership, will be started immediately as a majority of the working force and large quantities of material are available.

The Fairfield Mfg. Co., Lafayette, Ind., has been formed to manufacture differential and bevel gears for automobiles. The officers are all prominent in the Ross Gear & Tool Co., D. L. Ross, president; J. W. DeCou, vice-president and general manager.

The Chase Tractors Corp., Ltd., having issued \$750,000 of its authorized \$1,000,000 8 per cent. cumulative preferred stock, has secured a plant in Toronto, Ontario, and has taken over the Chase Motor Truck Co., of Syracuse, N. Y. The balance sheet shows that the corporation has assets of \$2,049,-209,90, and a surplus of \$196,695.09.

The Hartford Securities Corp., with preferred stock of \$1,000,000 and 7500 shares of common stock of no par value, has been formed to finance transactions of car and truck dealers. George Ulrich, vice-president of the American Industrial Bank and Trust Co., is president. Channing S. Timberlake, of the Hartford Fire Insurance Co., is vice-president. The new firm will buy conditional bills of sale. The firm's charter will allow entry into other than automotive fields, if this should be desired.

Trade Literature

The Clark Equipment Co., 1415 Railway Exchange, Chicago, with factories at Buchanan, Mich., has issued a beautiful catalog. Bound in imitation leather, embossed cover, full page etchings, done by W. M. Young, at the factory, reproduced in colors, drawings in detail, large illustrations of the assembled axles, detailed specifications, micro-photographs, magnified, of heat treated steels, used in the products, descriptions of the plant with its parks, lawns, greenhouses, theatre, with accompanying color illustrations, characterize this unusual trade publication. The personnel, the psychological factor, are also written up, and a list of Clark literature. about a dozen brochures, is given, copies of which are mailed upon request.

The Sun Company, 1428 S. Penn Square, Philadelphia, have issued a lubrication brochure, printed in colors, giving charts for guidance of lubrication, many tables of passenger and commercial cars, indicating the proper oils for each part and plates showing levels of oil in transmission, differential and other housings.

Gages, Catalog No. 43, Copyright, by the Greenfield Tap and Die Corporation, Greenfield, Mass., 1920, is a beautifully printed and valuable book of reference. Its value is increased by a good index. Nearly fifty pages of tables and standard screw thread formulae, besides engravings of gages, make this publication a handbook for the factory and machine shop.

The General Motors Acceptance Corporation, New York, announces that distributors and dealers in Delco light plants and water systems can have from one month to one year time on 60 to 75 per cent. of the list price of the Delco light or water system. It is expected that this plan will greatly increase the number of users of these Delco equipments. The system is the same as used by the automobile plan of General Motors, which is now doing a business of \$100,000,000 a year with dealers.

The Westinghouse Electric and Manufacturing Co. now gives an insurance policy of \$500 to every employee who has been in service six months or more. After April 1 policy holders may increase the value of their policies from \$1000 to \$2000, depending upon their length of service and continuity of savings.

New Agencies

A. S. Flanagan and W. A. Pederson, who have been many years with Charles E. Miller, 97 Reade St., New York, equipment jobbers, have resigned and formed The P. & F. Company, at 149 Church St., and will do a general equipment jobbing business.

The Sterling Tire Corp., Rutherford, N. J., has appointed as distributors, George L. Watkins, Birmingham, for state of Alabama; West Coast Rubber Co., and Oregon Rubber Co., Seattle, Wash., for the northwest; Charles A. Warren, San Francisco, for northern California, with offices at 575 Market St. Mr. Warren has made Maundrell and Walfish distributors for San Francisco city.

The Gunn Rubber Co., Hartford, Conn., has been appointed sole distributor of Goodrich motor truck tires in that territory.

The Automotive Products Corp. has been formed by Harry Kip, 989 Gerry St., San Francisco, a former sales manager of the Packard company. He will handle lines of goods for eastern makers.

Rantz and Halstead, Spokane, Wash., are now distributing agents for the Signal truck in that city.

The Jenkins Vulcan Spring Co., Richmond, Ind., has established its eighth direct factory branch, the new office being at 2043 West Broad St., Richmond, Va. The factory carries a reserve of 100,000 springs.

The J. H. Hale Co., 230 Main St., Hartford, Conn., has been appointed service representative for the Stromberg carburetor in that territory. L. L. Ensworth are the jobbers for this trade.

The Dicks Motor Co., recently organized, succeeds the Henderson-Dicks Co., at Raleigh, N. C., and will handle Standard trucks and Velie and Apperson cars.

Graham Bros. Sales Co., West 57th St. near Broadway, New York, have purchased the five-story building 100 x 125, at that location, the price being about \$300,000. The firm now has better facilities for distributing Bethlehem trucks. W. O. Crabtree is president and general manager.

The Stewart-Warner Speedometer Corp., Chicago, on April 15 will open a branch house in Peoria, and Daniel Hyland will be manager.

The Standard Motor Truck Co. will be represented in Colorado and adjacent states by the Standard Motor Truck Sales Co., Inc., with offices in Denver.

The Walter S. Burgess Co., St. Joseph, Mich., have formed their own sales organization, and P. H. Patten, one time with the Zinke Company, will be in charge.

The Rainier Motor Corp. announces two new agencies for the Rainier Worm Drive trucks, the Ballard-Tait Sales Co., Brunswick, Ga., and the Dowd Motor Co., 23 North St., Rochester, N. Y.

The Rockford Motor Car Co., Rockford, Ill., with capital stock at \$100,000, and Arthur L. Johnson, president, will distribute White trucks, tires and accessories.

The Pinkerton Motor Car Co., Bloomington, Ill., is a branch of H. B. Pinkerton, Peoria, Ill., and distributes Dodge trucks and cars. E. L. Buck, until recently in the Dodge factory, has purchased a half interest in the Bloomington branch.

The Reo Motor Sales Co., Decatur, Ill., has bought a \$35,000 property and will erect a three-story modern garage, 133 x 180. Besides distributing the Reo car in Macon county, the firm will handle tractors, trucks and power farming machinery.

Handle Heavy Truck Wheels with an



Figure Out For Yourself How Much You Can Save

With makeshift tools it may take three or four men an hour or longer to remove or mount a heavy truck wheel. With an ATLAS WHEEL CRANE one man can do it in one minute.

The old way may lay up the truck for a day to grease or adjust bearings. In addition to its being a mean, nasty job, there is constant danger of injury to men and of damage to bearings and brake linings.

With the ATLAS WHEEL CRANE, one man can remove or mount the heaviest wheel in one minute, with absolutely no danger to man or truck. Adjustment of bearings becomes a small job, and the truck loses practically no time.

The ATLAS WHEEL CRANE is powerfully built. Every part is three times as strong as necessary. It will lift a ton and will not break. The grip is positive—the heavier the wheel the tighter the grip.

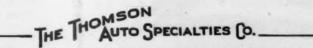
The crane requires very little clearance between wheel and fender or body, and is adjustable to any size of wheel or tire.

An ATLAS WHEEL CRANE will save damage to truck and injury to men, and will keep the truck in service.

If you handle heavy truck wheels, an ATLAS WHEEL CRANE will be a Big Money-saver for you.

The ATLAS WHEEL CRANE will pay for itself in a few weeks' time.

Write at once for further information, prices on equipment, etc.



Distributors Wanted in Territory where we are not now represented.

Dept. A-4 36-38 E. Chestnut St., Columbus, Ohio

ANNOUNCING The POWER TIE CONSTANT MESH TRANSMISSION With Steering Post Control

HE Power-Rite Transmission brings to the automotive industry a new principle in the operation of transmissions on motor cars and motor trucks.

It substitutes for the former method of changing speeds by means of the cumbersome gear-shift a new method of speedcontrol by an easily operated lever on the steering post.

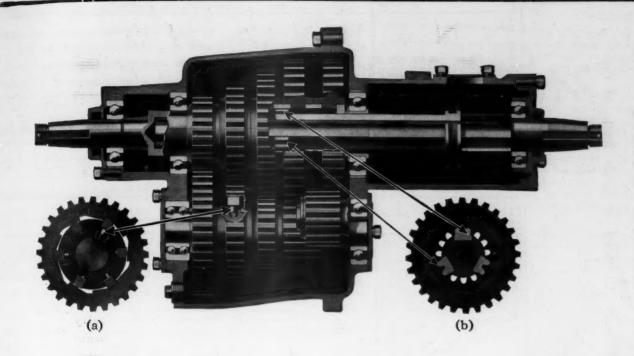
The Power-Rite Transmission entirely eliminates gear-shifting. Its gears are always in mesh.

Speed changes are accomplished by sliding-keys on the main transmission shaft which internally engage the various speed gears in response to the movement of the lever-control.



Power-Rite Installation in Motor Truck

Blueprints and detailed information will be sent on request to manufacturers of motor cars and motor trucks.



The Power-Rite principle of speed selection makes possible the changing of speeds without the usual jars and jerks. With gears constantly in mesh, there is no possibility of clashing, grinding or stripping—even under such severe strains as changing from a higher to a lower speed.

Power-Rite Transmissions have long since passed the experimental stage and have proven their practicability in actual service. The superiorities which they have demonstrated in rigorous tests over a long period have won for them the approval of leading engineers in the motor car and motor truck industry.

- (a) Detail of one-way dog clutch which gives full floating action to intermediate speeds on main shaft thus eliminating "jerking" or "pitching" when changing from high to a lower speed.
- (b) Cross section of main drive shaft showing sliding-key construction which controls speed selection.

The Detroit Transmission Company
166 Lycaste Avenue Detroit, Michigan

Commercial Car Engine Specification Table This Table, Which is Here Given for the First Time Will, Hereafter, be Included in Each Issue of the Chilton Automobile Directory

4 Cylinder Engines

		THE COMMIN	ERCIAL CAR JOURNAL APRIL 15, 1920									
CRANK		How Cast	· www.www.ww.ww.ww.ww.ww.ww.ww.ww.ww.ww.w									
CR		Material	400000000000000004444400440000044000000									
LS	oı	Distributor or Magne										
EQUIPMENT DETAILS		Starter, Location	口。它因我因我我我我我我 : : : : : : : : : : : : : : :									
DE	9vi1C	Generator, Loc. and I	CREET REPREDENTATION BETTER TOTAL CONTRACTOR									
LNS	Drive	Pump, Location and										
PME		Cooling, Thermo-S or	++++++++++++++++++++++++++++++++++++++									
5		Spark Plug, Size	SO THE SOUND SOUND SO SO SO SO SO SO SO SO SO SOUND SO									
E	.msiQ	Exhaust Pipe, Inside	a · · · · · · · · · · · · · · · · · · ·									
OR	t et	Location	日によりは、									
CARBURETOR	Outlet	Horizontal or Vertical	Ø:>:::::::::::::::::::::::::::::::::::									
RBU	0	Diameter	The state of money and the state of the stat									
		Make	OUN CO									
CONN.	1931	Length, Center to Cer	- 13000044113132220001222011113222001111331320000023 - 130000044113131322000012201111331320000023 - 13000000000000000000000000000000000000									
		Bushing Type	######################################									
		Diameter										
CRANKSHAFT PISTON	Groove Width		我我我就在我									
		No. Below Pin	H-000000000000000000000000000000000000									
		No. Above Pin	00000444000000000000000000000000000000									
		Material	\$0000000000000000000000000000000000000									
			14 : 14/4 : : : : : : 14 16/2/4 14 16/2/2 14 : 14 14/2 14/2/4/2/4/2/4 10/4 .									
	SButt	No. of Crankshaft Bes Weight, Pounds	ಯಯಹರುವಾರು ಯರುವುದು ಪರುವಯ ಪರುವಯ ಪರುವಯ ಪರುವ ಪ್ರಾಥಾಗಿ ಕಾರ್ ಕಾರ್ ಪ್ರಾಥಾಗಿ ಪರುವಯ ಪರುವ ಪರುವ ಪರುವ ಪರುವ ಪರುವ ಪರುವ ಪರುವ ಪರುವ									
		Main Bearings, Lengtl	######################################									
	-	Conn. Rod Bearings, I										
	Main Bearings, Diameter		A CALL CONTROL OF THE									
0		Diameter										
T	Number gg 7											
CAMSHAFT			<u></u>									
		Drive	NANAZARARA RAZARARAZA ZARAZAZAZA RAZAZAZAZA									
	-	Diameter	HE BESTER HE B									
	Location											
VALVES	Ex- haust	Clear Diameter	· OHHOOOOHHUHOOO HHOOO HHOOOHHUHOOO HAAAAAA . NA NA HAAAAAAAAAAAAAAAAAAAAAA									
			10/2/00/00/00/and and an									
	Clear Diameter		The Adalana Control of the second of the sec									
S		Valve Arrangement	×=====================================									
CYL- INDERS	ach.	Heads, Integral or Det										
E		Cast 1, 2, 3, 4 or 6	在在,在,在在在在在在在在在公司公司, ,在在在在在在在在公司在在在在在在在在在的任务。									
	sus	Height	4. 02120000000000000000000000000000000000									
	Width Di		ham 6/4 and 6/									
)ime		8 : 38 : 38 : 38 : 38 : 38 : 38 : 38 :									
1	Type of Lubrication Suerension, 3 or 4 Point		Page 1 and 1									
GENERAL	-		Testes / Ale Tes Institutes / Alestalas /									
	-	Bore and Stroke	44 24 44 75 24 74 74 74 74 74 74 74 74 74 74 74 74 74									
	ower	.M.A.A ts mumixaM	2100 2100 2100 2100 2100 2100 2100 2100									
	Horsepower	mumixsM	0.0000									
	Но	N.A.C.C. Rating										
		Weight	480 480 410 410 410 410 410 410 410 41									
		Name and Model Number	I N-3% I N-3% I E-4 I E-4 I E-4 I B-2 U-2 U-3 U-3 I B-2 I B-2 I B-4 I B-									
		N S										
-		Na.	M. C. K. M.									
1			LANGE BEREEFERE SEE STEELE SEE SEE SEE SEE SEE SEE SEE SEE SEE									

C

O

22

B

2

11

78 C

n|0

0

00

O

1 5/8

9 5% 3

B

563 25.3 57 2100 314x5

Herschell-Spillman 11000.

6 Cylinder Engines

1

440000444440444444
***** * : 4444 : 444444
:: 弘乙茂成乙戌戌氏氏 : 及及及及及及氏
HANNEL HANNER CAL
ととててはとりとりとりとりとりとしていい。 : ::: 以いしししずししればははしし
100 100 100 100 100 100 100 100 100 100
2000-00000000 :0000000 ZA*** % ********************************
以及我们工程工程及我就就就就就就就

774 : :4 : : : : : : : : : : : : : : : :
<u> </u>
taka Takakaka Taka . Kaka
22000202020202020202020202020202020202
0000000: #####00###00
11/2/2/2/2/2/2/2/2/2/2/2/2/2/2/2/2/2/2/

000000000000000000000000000000000000000
000000000000000000 0000000000000000000
11 :00000000000000000000000000000000000
>> \qqqqqqqqqqqq>>
\$\langle \text{\$\langle \tx}\$}}}}}}}}}}}}}}}}}} }}}}} } } } } } } } } } } } } } } }
20000000000000000000000000000000000000
202222 - 202222 20222 20222 2
>>>====================================
00 00 00 00 00 00 00 00 00 00 00 00 00
###
《沙沙沙沙沙沙沙沙沙沙沙沙沙沙沙沙沙沙沙沙沙沙沙沙沙沙沙沙沙沙沙沙沙沙沙沙沙
(20/00/00/00/00/00/00/00/00/00/00/00/00/0
:: 100000000000000000000000000000000000
(%)/%/ala-ja-ja-ja-ja-ja-ja-ja-ja-ja-ja-ja-ja-ja
祖祖した江田としてた五田としたしたし
999999999999999

866 222 232 288 865 55 55 55 55 55 55 55 55 55 55 55 55 5
72 ::::.74
884444
1122224 0000000
QQ:00000000000000000000000000000000000
WAXXXX
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
44000404444000444440
2252 2452 2452 1000 1000 1000 1000 1000 1000 1000 10
: 388.42884688848884828
858408555000000000000000000000000000000
BADDON OUT
DD
rins rins rins rins rins rins rins rins
Stea Sup: Turi Turi Turi Wau Wau Wau Wiso Viso Viso Viso Viso Viso Viso Viso V

Brand Name and Makers' List A. S. V.—American Sleeve Valve Co., New York City, N. Y. Beaver—Beaver Mig. Co., Milwankee, Wis. B. M. C.—Bethlehem Motors Corp., Pottstown, Pa. Brennan—Brennan Motor Mig. Co., Syracuse, N. Y. Buffalo—Buffalo Gasoline Motors Corp., Pottstown, Pa. Buffalo—Buffalo Gasoline Motors Corp., Detroit, Mich. Continental—Continental Motors Corp., Detroit, Mich. Erd—Erd Motor Co., Saginaw, Mich. Detroit, Mich. Gray Victory—Gray Motor Co., Detroit, Mich. Herschell: Spillman—Herschell-Spillman Motor Co., Detroit, Mich. Herschell-Spillman—Herschell-Spillman Motor Co., Tonawanda, P. Herschell-Spillman—Herschell-Spillman Motor Co., Williamsport, Pa. Light—Light Mig. & Fdy. Co., Pottstown, Pa. Light—Light Mig. & Fdy. Co., Pottstown, Pa. Lycoming Fdy. and Machine Co., Williamsport, Pa. Minerya—Minerya Engine Co., Cleveland, O. Minerya—Minerya Engine Co., Cleveland, O. Minerya—Stearns Motor Corp., Warren, O. Supreme Motor Corp., Warren, O. Twin City—Mineapolis, Min. Waukesha—Waukesha Motor Co., Waukesha, Wis. Wisconsin—Wisconsin Motor Mir. Co., Minwaukee, Wis. Wisconsin—Wisconsin—Wingers.

(Diameter) Mainbearings (Diameter) Crankcase (How Cast) C—Cylinder S—Separate Camshaft (Diameter) Crankcase (Material)
A—Aluminum
C—Cast Iron
1/2—Semi Steel Carburetor (Make) S—Stromberg Z—Zenith Abbreviations Used in Above Table In all specifications Q-Optional Distributor or Magneto Location Carburetor Location Generator Location starter Location Pump Location C-Center L-Left R-Right F-Front L-Left R-Right L-Left R-Right shaft Location

Salesman Needs Small Advertising Matter

By C. R. KENT

The traveling salesman and the dealerare missing many opportunities to boost the truck which he is selling for want of appropriate advertising matter to meet certain conditions.

As we go about our business we meet many people who are interested in talking trucks, not from a buying standpoint, but as a subject of conversation. These people are not sufficiently interested to warrant the issuance to them of our large truck catalogue or other large and costly advertising matter. In fact, they would not in most cases even take this advertising matter if it was offered to them.

What is needed in a case of this kind is a miniature circular, something that will slip in the vest pocket the same as a card, containing the important facts about your truck. A circular of this description will be read in most instances and will tend to bring your particular truck to the attention of this man, so when the subject of trucks comes up in the future he will know something about "Bestever" trucks.

This piece of indirect advertising could be made up in two different styles—as a business card, made double, with the card on the front, a picture of the truck on the back, and the specifications of the truck on the inside, or as a folding circular folded to about the size of a card. A small circular of this nature, if printed in small type, could contain nearly as much information as some of the larger catalogues and circulars. Or it could cover all the salient points in an impressive and forcible manner.

One of these pieces of advertising matter handed out with a few words about your particular make of truck, may be just the means of closing a sale, for it is a well known fact that a few good! words from a disinterested party to a friend of his will be worth a whole hour of argument by the salesman.

Stutz Brings Out High-Duty Fire Engine

The Stutz fire engine, which recently made its appearance before the public and satisfactorily passed the underwriters test at the International Convention held in Kansas, Mo., manufactured by the Stutz High Duty Fire Engine Company, Indianapolis, Ind., is being built in the following models:

Triple combination hose, chemical and pumping engine, combination chemical and hose, straight hose, double-tank chemical and squad or insurance car.

These jobs, which are driven by threespeed selective transmissions, are featured by a pump that is said not to foul or choke. These pumps are equipped with automatic relief valves, a necessary safety feature for high duty pumping engines. They also embody all the recognized ideas essential for an effective fire-fightingmachine.

Activities of the Motor Truck Association of Philadelphia

OFFICERS

J. P. CRANSTON President W. R. WALTON W. Y. ANTHONY
Vice President
W. H. METCALF, Sec'y
328 N. Broad Street



T. K. QUIRK

BOARD OF GOVERNORS
J. O. HOWLEY

E. P. GAUL

F. A. KISSEL

H. A. NEILL

. . .

THE COMMERCIAL CAR JOURNAL OFFICIAL ORGAN

The monthly meeting of the Motor Truck Association of Philadelphia, held on March 17th, at the Hotel Adelphia, at which 182 members and guests were present, was converted from a business session into a care-free festivity in observance of St. Patrick's Day. the exception of reports from Secretary W. H. Metcalf and the committee chairmen, no business was transacted. Mr. Metcalf called attention to the number of replies received to the invitation sent out to the members to participate in a "Ship by Truck Farm Tour" the third week in May, and stated that the number so far received would barely warrant the conducting of such a tour.

President J. P. Cranston announced that if the members of the association believed that such a tour would be beneficial they should immediately send in their requests to be enlisted as participants, and stated that unless at least 18 or 20 trucks were listed, the tour would hardly be feasible. He regretted this fact, as similar tours are to be conducted in farm sections from every leading city in the country during that week in May. H. M. Gallagher, chairman of the Membership Committee, presented 45 applications for new membership in the association.

The entertainment of the evening was provided by the Entertainment Commit-

tee, of which R. Arthur Bittong, Howard B. Armstrong and C. H. Walz are mem-Chairman Bittong did himself credit in providing an entertainment that was redolent of the Emerald Isle from beginning to end. He made the welkin ring with a 25-piece fife and drum corps that filled the hotel with typically Irish airs for a half hour. This was followed by an exceedingly entertaining program of singers, vaudeville actors, a harpist, a pianist, a card trickster, a violinist, etc., most of these giving Irish selections. The members were all supplied with green paper caps and shamrock for their coat lapels.

Service Association of New York Discuss Ford Service

NEW YORK, April 6.—Specializing Mechanics was the subject of an address by Frank J. Lowe, service manager of the Bronx County Auto Company, at the regular monthly meeting of the Automotive Service Association of New York, held this evening. He gave a very comprehensive description of how Ford cars, commercial and passenger, were serviced and described in detail the flat rate, how labor was handled and how the system made for speed and efficiency and reduced comebacks to a minimum.

In conclusion Mr. Lowe said: "We are all bound together in our many districts and varied pursuits for the purpose of serving the public, and obtaining that exacting party's good will. Good will is the most valuable asset a business man can acquire. It is one of those intangible assets that grow with a business. Some men can be in business 50 years, apparently successful, and yet do not create any large volume of good will. Other men are on record as having created an ocean of good will in one year.

"To build good will and a good business at the same time should be one of the easiest propositions which faces the business man. It is entirely a personal matter with the head of the business, or the department, and should begin to sprout the first day he takes charge. Good will not only embodies the respect of the community surrounding your business, but it also brings the desire on the part of the community that your business shall be successful. The fundamentals for good will are cheerfulness, courtesy, affability, consideration, prompt attention, fair prices, the square deal, and last but not least, ready and efficient service, a service whose first consideration is the welfare of the customer.

"This does not mean that the personal interests of your business are to be sacrificed for the customer's profit, or for the good of the trade. On the contrary, with correct business principles established as the track upon which it shall run, and with such principles adhered to rigidly as well as religiously, value received is a certainty both for the customer and the business. But that is only playing fair. Good will requires something more, namely, the personal touch of the individuals who compose the organization; that personal touch that is not a camouflage of excuses to cover a lack of service; but-that genuine interest in the welfare of your customers, friends, employees and the public generally."

H. S. Hood, of the United American Metal Corporation, read a paper on selecting babbitt for bearing material which was not only instructive but interesting.

A number of new members were elected. The total membership is rapidly reaching the 200 mark. On April 13th, J. H. Lang will read a paper on apprenticing mechanics. He has been connected with the automobile industries since its incipiency and an interesting address is anticipated.

Jacksonville Truck Tour Proves Worth of Trucks on Sand Roads

Fourteen trucks, of from one to two and a half-tons capacity, all equipped with pneumatic tires, pulled out of Jacksonville, Fla., Monday morning, March 29th, for a week's tour of the northern-central part of the state. The tour was staged by the Jacksonville dealers, details being handled by a committee consisting of Conrad Mangels, chairman, and R. O. Riddle, of Jacksonville, and J. K. Wynn, of Tampa. E. J. Estes, of Jacksonville,

was train commander. Stops were made and demonstrations given at Mittleburg, Gainesville, Ocala, Leesburg, Eustis, Orlando, Sanford, Daytona and other points.

During the first part of the tour, especially, the majority of the roads encountered were very poor, being mostly of soft shifting sand. Every truck came through without road difficulty, however. A feature of the second day's run was a five-mile trip along a dry creek bottom, which was also negotiated without difficulty. Each night the trucks were parked in the centre of the city selected as a night control, the trucks being equipped with parking lights supplied with current by a farm lighting plant carried on one of the machines.

Charles E. Graham was the lecturer on the tour, and gave short talks at each stopping place on the value of the motor truck and other power farming equipment to the farmer.

The trucks participating in the tour included the following makes: Velie, White Hickory, Indiana, Autocar, Republic, Armleder, International, Vim, Reo, Oshkosh, Maxwell and Federal. The dealers who participated were well satisfied with the results of the tour.

Trailers Give Economical Service

AKRON, OHIO, April 5.—Basing his estimate upon reports from sixty-five trucks using centers, E. Farr, director of the Firestone Ship by Truck Bureau states that trains composed of trucks and trailers will soon be seen upon the highways as frequently as trucks are now seen. The trailer upon good and level roads can reduce operation costs 20 to 40 per cent. Train operation economies that hold good upon railroads are not impossible in the operation of trains of trucks and trailers upon highways.

THE COMMERCIA CAR JOUR

Vol. XIX

PHILADELPHIA, MAY 15, 1920

Published the 15th of each month by the

CHILTON COMPANY

Market and 49th Streets

Philadelphia, U.S.A.

JAMES ARTMAN, President C. A. MUSSELMAN, Treas. & Gen'l Mgr. GEO, H. BUZBY, Vice President A. H. VAUX, Secretary

ADVERTISING DEPARTMENT

C. MONROE SMITH, Eastern Manager
S. S. CHISHOLM, Chicago
J. C. WEED, Detroit
E. W. CORMAN, Cleveland
GEO. D. ROBERTS, Advertising Director, Chilton Service

EDITORIAL DEPARTMENT

JAMES ARTMAN, Editor in Chief ALBERT G. METZ, Managing Editor MARTIN J. KOITZSCH, Associate Editor

EDITORIAL REPRESENTATIVES

C. P. SHATTUCK, Field Editor A. V. COMINGS, Western CHESTER S, RICKER, Technical HARRY R. BRATE

TABLE OF CONTENTS

Advertisers' Index	328
Buyers' Index of Reading and Advertising Pages	322
Commercial Car Specifications	75
Editorials	39
Equipment and Appliances	51
Metal and Rubber Markets	102
New Commercial Cars	44
News of the Trade (Including Personals, New	
Agencies, Factory Items, Etc.)	96
Pneumatic Tire Prices	86
Replacement Table	71
Service and Repair Departments	55
SPECIAL ARTICLES	

Truck Transportation Feature of Chamber of Com-

merce Meeting	17
Columbus Motor Truck Boosts Sales	18
What's the Best Way of Selling the Farmer	19
Trailers Double Motor Truck Efficiency	21
Buses Compete With Street Cars	
Is There Money in Handling Motor Truck Equipment?	25
Efficient Loading Facilities Necessary With Dump Bodies	26
National Ship by Truck for Short Hauls	40
Making an Asset of the "Lost" Prospect	58
Novel Policy in Servicing Magnetos	60
Advertising the Filling Station	64
Will Pneumatic Truck Tires Ever Replace Solids?	104

			St	JBS	CR	PT	ION	R.	ATI	S					
United States	and	Poss	essi	ons		-			-			-			\$2.00
Canada -	-		-	-	-	-		400	-	-	-	-	-	-	3.00
Foreign -						-					-	-	-	-	4.00
Single Copies			-	-	-	-			-	-	-	-	-	- 10	400
Make	Chec	ks. M	Ione	y OI	der	, etc	e., p	ayab	le to	Ch	ilton	Co	mpa	ny	
Change of A	ddres	38—S		ribe						ress	cha	nge	d sh	oul	d give

The Commercial Car Journal is a member of the Audit Bureau of Circulations, the Recognized Authority on Circulation Audits

Guaranteed **Forgings**

We have no desire to make ALL the forgings used in the industry, but for any VITAL part where the forgings call for "more than ordinary" service, we gladly offer our facilities for the solution of your problems.

Wyman-Gordon

"The Crankshaft Makers" Worcester. Mass. Cleveland, Ohio

I/ YOUR TRUCK BUILT LIKE A FAT MANA

A REALLY fat man is an object of pity. He carries so much excess weight that he is a burden to himself. His useless flesh exacts such a toll on his energy that his heart cannot stand the strain.

Your motor truck is just as handicapped if you have burdened it with excess weight. Malleable iron castings, drop forgings mean excess weight.

Bossert Pressed Steel Parts, of which there are over 200, lighten your design without sacrificing strength or dependability. They "train down" the overweighted truck and substantially decrease operating costs.

Your final success is dependent on the cost reports that your users are going to examine and compare with those of other makes.

The use of Bossert Light-Weight Pressed Steel Parts will enable your truck to prove its fitness by operating efficiently and economically.

The advice of our engineering experts is at your disposal. Write us.

The Bossert Corporation

Main Office and Works:

Utica, N. Y.

Branch Offices:
Cleveland, Ohio, 611 Citizens Bldg.
Detroit, Mich. 1513 Ford Building
New York City 30 Church Street



DOUBLE PART